FACT SHEET FOR AQUATIC NOXIOUS WEED CONTROL GENERAL NPDES PERMIT

SUMMARY

The State of Washington Department of Ecology (Department) has tentatively determined to issue a general permit for the application of herbicides to control noxious and quarantine weeds in surface waters of the State of Washington. The use of herbicides is subject to the provisions of integrated pest management plans (IPMs) and conditioned in salmonid bearing waters. Monitoring is required of and developed by the permittee. Any short term toxicity to aquatic organisms is allowed under the terms of the permit and the water quality modification provisions to perform essential activities that protect other beneficial uses of the waters of the state. The proposed terms, limitations and conditions contained herein are tentative and may be subject to change, subsequent to public comments received by the department and testimony provided at public hearings. All activities accepted under the general permit will not be relieved of any responsibility or liability at any time during the life of the permit for violating State water quality standards; or violating any other local, State, or Federal regulation or standard as may pertain to the individual activity. Pesticide applications to surface waters not accepted under a general permit may be required to apply for an individual permit. Any surface water application of herbicide found not covered under either the general permit or an individual permit may be considered to be operating without a discharge permit and subject to potential enforcement action.

On March 12, 2001, the Ninth Circuit Court of Appeals decided that application of a herbicide in compliance with the labeling requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) did not exempt an irrigation district from needing to obtain a NPDES permit. (Headwaters, Inc. v. Talent Irrigation District). Ecology, as had many more states, had been issuing orders that were not NPDES permits that placed protective conditions on the use of herbicides in waters of the state. This general permit will replace those short term modifications where herbicide applications are directed into surface waters of the state for the purpose of controlling noxious weeds.

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INTRODUCTION

This fact sheet is a companion document that provides the basis for issuance of the Aquatic Noxious Weed Control National Pollutant Discharge Elimination System (NPDES) General Permit. The Department of Ecology (the Department) is proposing to issue this permit, which will allow discharge of wastes from aquatic noxious weed herbicide applications and from nonchemical methods associated with herbicide application to control noxious and quarantine weeds to surface waters of the State of Washington, which are also waters of the United States, pursuant to the provisions of chapters 90.48, 90.52, and 90.54 Revised Code of Washington (RCW) and the Federal Water Pollution Control Act (FWPCA) as amended. This fact sheet explains the nature of the proposed discharges, the Department's decisions on limiting the pollutants in the wastewater, and the regulatory and technical basis for these decisions.

The Federal Clean Water Act (FCWA, 1972, and later modifications (1977, 1981, and 1987), established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of Chapter 90.48 RCW which defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The establishment of a general permit for Aquatic Noxious Weed Control is appropriate due to the similar environmental fate specific to each permitted herbicide, the specific requirements of RCW 90.48.445 and 90.48.448, the statewide scope of aquatic noxious weed control, and the significant reduction of resources necessary for permit handling. However, individual permits will still be considered in those instances where a proposed activity requires more detailed guidance, or when an individual applicator so desires and the Department approves.

The regulations adopted by the State include procedures for issuing general permits (Chapter 173-226 WAC), water quality criteria for surface waters (Chapters 173-201A WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastes to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-226-110) for issuing a general permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the draft permit, public hearings, comment periods, and public notice of issuance are all required before the general permit is issued (WAC 173-226-130). The fact sheet, application for coverage, and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by representatives of the potential permittees and other members of a permit advisory group. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response

to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The original fact sheet will not be revised after the public notice is published. Comments and the resultant changes to the permit will be summarized in Appendix F--Response to Comments.

BACKGROUND INFORMATION

In May, 1996, the Talent Irrigation District (TID) in southern Oregon applied the herbicide acrolein to an irrigation canal. A leaking waste gate resulted in the discharge of treated water into Bear Creek where a fish kill occurred.

Headwaters, Inc. and Oregon Natural Resources Council filed a Clean Water Act citizen suit against the Talent Irrigation District (TID) for applying aquatic herbicide into a system of irrigation canals. Reversing a district court's opinion, the Ninth Circuit in a March 12, 2001 decision held that application of the herbicide in compliance with the labeling requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) did not exempt TID from having to obtain a National Pollutant Discharge Elimination System (NPDES) permit, and that the irrigation ditches were "waters of the United States" under the Clean Water Act.

The department is issuing the general permit so that the application of aquatic herbicides for the control of noxious and quarantine weeds will be compliant with the Clean Water Act. For purposes of this fact sheet, the term noxious weed also includes the weeds on the quarantine list which is found at WAC 16-752-500 through 525. These weeds when found are treated as noxious weeds. They are not on the noxious weed list only because they are not yet present in the state or are not at great distribution levels.

The Federal Insecticide, Fungicide, and Rodenticide Act of 1979 (FIFRA), as administered by the United States Environmental Protection Agency (EPA), requires that all persons who apply pesticides classified as restricted use be certified according to the provisions of the act or that they work under the supervision of a certified applicator. Commercial and public applicators must demonstrate a practical knowledge of the principles and practices of pest control and safe use of pesticides, which is accomplished by means of a "core" examination. In addition, applicators using or supervising the use of any restricted use pesticides purposefully applied to standing or running water (excluding applicators engaged in public health related activities) are required to pass an additional exam to demonstrate competency as described in the code of federal regulations as follows:

> "Aquatic applicators shall demonstrate practical knowledge of the secondary effects which can be caused by improper application rates, incorrect formulations, and faulty application of restricted pesticides used in this category. They shall demonstrate practical knowledge of various water use situations and the potential of downstream effects. Further, they must have practical knowledge concerning potential pesticide effects on plants, fish, birds, beneficial insects and other organisms which may be present in aquatic environments.

> Applicants in this category must demonstrate practical knowledge of the principles of limited area application." (40 CFR 171.4)

Aquatic plants provide habitat and food for aquatic life. Human activities have created unwanted consequences in native aquatic ecosystems. Nutrient additions cause increased growth of plants and introduction of non-native plants can cause shifts in the native ecosystem. The non-native plants often do not have any predators or parasites and may outcompete beneficial plants. A major reason for the existence of weed problems is the introduction of exotic species from other locations. These plants quickly replace native vegetation and may dominate large acreages. This group includes the most troublesome weeds such as cordgrass, Eurasian watermilfoil, purple loosestrife, and hydrilla. When a nonnative aquatic plant has the potential to lessen ecosystem diversity and negatively impact beneficial uses of waters of the state, it may be listed as a noxious weed.

A herbicide formulation consists of an active ingredient, an inert carrier, and perhaps adjuvants. Every herbicide must be registered for use in the United States by the EPA.

Table 2. Classification of aquatic herbicides used in noxious weed control

ABSORPTION CHARACTERISTICS

Contact Herbicides

Diquat, Endothall

Systemic Herbicides

2,4-D, Fluridone, Glyphosate, Imazapyr, Triclopyr

PHYSIOLOGICAL PROCESSES

Tissue Development

2,4-D

Photosynthesis

Diquat, Fluridone

Respiration

Endothall

Nitrogen Metabolism and Enzyme Activity

Glyphosate

SELECTIVITY

Nonselective (Broad Spectrum)

Diquat, Endothall, Glyphosate, Imazapyr, Fluridone (may be selective in low Concentrations).

Selective

2,4-D, Triclopyr

Aquatic herbicides can disappear from treated water by dilution, adsorption to bottom sediments, volatilization, absorption by plants and animals or by dissipation. Dissipation refers

to the breaking down of an herbicide into simpler chemical compounds**.** Herbicides can dissipate by photolysis (broken down by light), hydrolysis, microbial degradation, or metabolism by plants and animals. Both dissipation and disappearance are important considerations to the fate of herbicides in the environment because even if dissipation is slow, disappearance due to processes such as adsorption to bottom sediments makes a herbicide biologically unavailable.

2,4-D

Dissipation of 2,4-D is mostly by microbial degradation. A small amount of photodecomposition and breakdown by tolerant plants also occurs. Volatile forms of 2,4-D are not used for aquatic weed control and therefore volatilization is not an important route of disappearance after aquatic weed control applications. Complete decomposition usually takes about 3 weeks in water and can be as short as 1 week.

Diquat

After application to enclosed ponds for submersed weed control, diquat is rarely found longer than 10 days after application and is often below detection 3 days after application. The most important reason for the rapid disappearance of diquat from water is that it is rapidly taken up by aquatic vegetation and bound tightly to particles in the water and bottom sediments. When bound to certain types of clay particles diquat is not biologically available. When it is bound to organic matter it can be slowly degraded by microorganisms. When diquat is applied foliarly it is degraded to some extent on the leaf surfaces by photodegradation, and because it is bound in the plant tissue a proportion is probably degraded by microorganisms as the plant tissue decays.

Endothall

Like 2,4-D, endothall is rapidly and completely broken down into naturally occurring compounds by microorganisms. This is the primary method of endothall breakdown. The by-products of endothall dissipation are carbon dioxide and water. Complete breakdown usually occurs in about 2 weeks in water and 1 week in bottom sediments.

Fluridone

Dissipation of fluridone from water occurs mainly by photodegradation. Metabolism by tolerant organisms and microbial breakdown also occurs, and microbial breakdown is probably the most important method of breakdown in bottom sediments. The rate of breakdown of fluridone is variable and may be related to time of application. Applications made in the fall or winter when the sun's rays are less direct and days are shorter result in longer half-lives. Fluridone usually disappears from pondwater after about 3 months but can remain up to 9 months. It may remain in bottom sediment between 4 months and 1 year.

Glyphosate

Glyphosate is not applied directly to water for weed control, but when it does enter the water it is bound tightly to dissolved and suspended particles and to bottom sediments and becomes inactive.

Some of the emergent or floating leaved noxious weeds that are treated with herbicide when the plant is not under water include, but are not limited to:

cordgrass	*Spartina* species
water primrose	*Ludwigia hexapetala*
garden loosestrife	*Lysimachia vulgaris*
purple loosestrife	*Lythrum salicaria*
wand loosestrife	*Lythrum virgatum*
fragrant water lily	*Nymphaea odorata*
yellow floating heart	*Nyphoides peltata*
flowering rush	*Butomus umbelatus*
grass-leaved arrowhead	*Sagittaria graminea*
hairy willow herb	*Epilobium hirsutum*
marsh dew flower	*Murdannia keisak*
European frog-bit	Hydrocharis morsus-rana
reed canarygrass	*Phalaris arundinacea*

Noxious weeds that are treated with herbicides directly into surface waters of the state include, but are not limited to:

hydrilla	*Hydrilla verticillata*
Brazilian elodea	*Egeria densa*
fanwort	*Cabomba caroliniana*
parrotfeather	*Myriophyllum aquaticum*
Eurasian watermilfoil	*Myriophyllum spicatum*
African elodea	*Lagarosiphon major*
mud mat	*Glossostigma diandrum*
slender-leaved naiad	*Najas minor*
swollen bladderwort	*Utricularia inflata*
water chestnut	*Trapa natans*

For more information about noxious and quarantine weeds see the following websites:
Ecology's website address is: http://www.ecy.wa.gov/programs/wq/plants/weeds/index.html
The Washington State Noxious Weed Control Board's web site address is:
http://www.wa.gov/agr/weedboard/weed_info/contents.html
Agriculture's Quarantine Weeds are listed at:
http://www.wa.gov/agr/weedboard/weed_list/prohibited.html

HISTORY OF AQUATIC HERBICIDE ENVIRONMENTAL REVIEW

In 1980, Ecology completed an *Environmental Impact Statement* (EIS) for statewide program guidance in the issuance of short-term modifications for herbicides used in aquatic plant control. Since 1980, a number of mechanical and physical methods (i.e. mechanical harvesting, rotovation, bottom barriers, and cutters) were developed and used extensively for aquatic

vegetation control, and various methods of biological control have undergone research and development during the past two decades. Changes also occurred in the understanding of aquatic ecosystems, including the role of wetlands and the need to consider and control impacts such as nutrient and sediment loading within the total watershed of any particular waterbody. To address these changes and the broadening field environmental choices in aquatic plant management, Ecology updated and supplemented the EIS with the *Final Supplemental Environmental Impact Statement for the Aquatic Plant Management Program* (SEIS), dated January 1992.

The current supplement, SEIS 2001, updates the 1992 SEIS and assesses new aquatic herbicides or permitted herbicides with recent label changes, for use in Washington waters. The herbicides were selected by the Agency Steering Committee for Update of the 1992 Aquatic Plant SEIS on the basis of registration status, desirability for use and direction from Senate Substitute Bill 5424 (1999, codified in RCW 90.48.447).

Ecology is the primary lead for the current supplemental update to the SEIS, but has received advisory and review assistance from the Agency Committee for Update of the 1992 Aquatic Plant SEIS (The Steering Committee). The Steering Committee is comprised of representatives from the State Departments of Agriculture, Health, Fish and Wildlife, Natural Resources, Ecology and the State Noxious Weed Control Board, all agencies with jurisdiction and/or interest in aquatic plant control. The Washington State Department of Agriculture (WSDA) is charged with regulating pesticide applicators, registering pesticides for use in the state, and, along with the State Noxious Weed Control Board, with controlling noxious plants within the state. The Department of Health is charged with protection of human health. The Department of Fish and Wildlife has received requests for Hydraulic Project Approvals (HPA's) to implement various physical and mechanical methods and is charged with protecting fish and wildlife. The Departments of Natural Resources and Ecology have concerns with the potential impact of various plant control methods on the natural resources they are charged with managing. The Departments of Fish and Wildlife and Natural Resources have also been mandated by the legislature to develop programs for controlling particular noxious emergent species on state-owned or managed lands.

The 1980 EIS evaluated the impacts of endothall, diquat, dichlobenil (2,6-dichlorobenzonitrile), 2,4-D [(2,4-dichlorophenoxy) acetic acid], copper sulfate, komeen and simazine, all aquatic herbicides used for control of nuisance aquatic vegetation. Since 1980, diquat, dichlobenil, 2,4-D, and simazine were discontinued for use in the program and fluridone and glyphosate were introduced. The 1992 SEIS introduced an integrated pest management approach as the preferred method of control and evaluated the use of chemical controls only, physical controls only, biological controls only, continuation of current practices, and taking no action relative to controlling nuisance aquatic plants. The 1992 SEIS evaluated and allowed the use of copper, endothall, fluridone and glyphosate to control various types of aquatic plants. SEIS 2001 contains an update of the alternatives included in the 1992 supplement and evaluates two additional sets of herbicides. The first set includes 2,4-D formulations registered for aquatic use by the state and endothall formulations Hydrothol® 191 and Aquathol®, completed May 2000. A second set of assessments, scheduled for completion February 2001, will evaluate diquat, triclopyr, and copper compounds.

CLASSIFICATION OF ADJUVANTS

Adjuvants can be grouped into three categories, activator adjuvants, spray-modifier adjuvants and utility-modifier adjuvants. The following is a description of the different types of additives grouped into categories according to the type of action as described by C. G. McWhorter in WSSA's, *Adjuvants for Herbicides*.

Surfactants

Surfactants are commonly used herbicide additives associated with the enhancement of penetration of the spray solution through the leaf tissues. The increase in leaf penetration is associated with a reduction of surface tension of liquids, which improves wetting of the leaf surface. Increased penetration may also be due to the surfactant dissolving leaf tissue components.

Wetting Agents

The term "wetting agent" applies to any spray additive that increases the ability of water to displace air or liquids from a plant surface. This displacement helps spread the spray solution over the entire plant surface more evenly. Some degree of wetting is also a property of all surfactants, however the extent of wetting may vary greatly among products.

Oils

Water emulsions with many herbicides can increase weed control. The oil-water emulsion may increase retention time of sprayed material and enhances uptake through leaf surfaces. Most marketed oil-surfactant concentrates contain around 80% oil and 20% surfactant in their formulation. The rate of application varies, but a rate of 1 qt per acre to 2 gal per acre is most common. Many herbicides are formulated as emulsions and have a milky appearance when added to water.

Spray-Modifer Adjuvants

This group of adjuvants has its greatest influence on the delivery and placement of the spray solution. Additives which alter or modify the spray, such as polymers, inverts, and foams, are included in this group.

Stickers, Spreaders and Spreader-stickers

Stickers are made of vegetable gels, resins, mineral oils, vegetable oils, waxes, or latex polymers. Spreaders are blends of surfactants, primarily nonionic (uncharged particles), used for spreading and adhering spray droplets to foliage. Spreader-stickers simply combine the two for additional retention during wet conditions. These materials are often more expensive than surfactants and therefore have limited use with herbicides; most are marketed for wettable powder formulations of fungicides and insecticides.

Polymers

Used in aquatic plant control primarily for drift control, these long-chain carbon molecules (up

to 40,000 carbon units per polymer strand), are also used to help break surface tension of the water surface to aid in sinking the herbicide. Depending on the type of polymer formulation and the extent of drift control desired, the rate is usually between 0.1% and 1.0% of the total spray volume. Polymers marketed as sinking agents are designed for that particular purpose. They have a higher molecular weight, are generally formulated as an emulsion and require good agitation. Polymers formulated for drift control on the other hand are easier to mix, require less agitation and are generally formulated as solutions. Solution polymers are not formulated as sinking agents and generally dissociate when they contact the water surface.

Utility-Modifier Adjuvants
Utility modifiers are materials that when added to the spray solution improve the conditions in which the formulated mixture is useful. Types of modifiers include emulsifiers, dispersants, stabilizing agents, coupling agents, co-solvents, compatibility agents, buffering agents, and antifoam agents. Buffering agents, marker dyes, and antifoam agents are perhaps the only two with aquatic plant management significance.

Marker Dyes
Low toxicity dyes may be added to the spray mixture to mark where otherwise colorless mixtures have been applied. Dyes used in this way help to reduce overspray and underspray.

Antifoam agents
These materials are most commonly silicone based and are used for eliminating foam in the spray tank. Generally used at 0.1% or less of the total spray volume, these additives are especially useful when mixing herbicides with soft water, where foaming problems are usually greatest.

DESCRIPTION OF AQUATIC HERBICIDE APPLICATION TECHNIQUES

The primary application methods and nozzle considerations in aquatic weed control are:

1. Handgun spraying of surface, emersed, and ditch bank species: Handguns are equipped with nozzles that provide a high flow rate (3 to 6 gal/minute), a straight stream, and a large droplet size. This arrangement ensures thorough wetting of the target vegetation with minimum spray drift. Low volume back pack sprayers are often used for emergent plant control. The applicator may also wick or “paint” the herbicide directly onto the targeted plant.

2. Subsurface injection just below the water surface for submersed weed control: Usually short hoses are spaced at approximately 2-ft intervals on a short, bow or stern-mounted boom. Hoses are just long enough to place the nozzle at the water surface or just below it. The nozzle body contains a disk that meters the flow into the water.

3. Bottom placement or deep-water injection: Nozzles are located at the end of long hoses that trail from a boom on the bow of the boat. Hoses are usually weighted to keep the

herbicide placement deep within the weed mat or near the bottom. A common arrangement involves constructing a nozzle by drilling small holes in a piece of galvanized pipe. The length of the pipe depends on how much weight is needed to lower the hose to the desired depth. Pipe length varies from 9 to 30 in. The pipe is capped on one end and attached to the hose on the other. Deep-water injection hoses must not have any clamps or protrusions that will catch and hold plants.

4. Bow-mounted centifugal or blower-type spreaders: Granular herbicides are normally applied with a bow-mounted centrifugal or blower-type spreader. Centifugal spreaders use a rotor that slings the material. Blower-type spreaders use air pressure to propel the granules.

REGULATORY POLLUTION REDUCTION REQUIREMENTS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits, either technology- or water quality-based must be chosen for each of the parameters of concern.

TECHNOLOGY BASED WATER QUALITY PROTECTION REQUIREMENTS

Sections 301, 302, 306, and 307 of the FWPCA established discharge standards, prohibitions, and limits based on pollution control technologies. These technology-based limits are "best practical control technology" (BPT), "best available technology economically achievable" (BAT), and "best conventional pollutant control technology economically achievable" (BCT). Compliance with BPT/BAT/BCT may be established using a "best professional judgement" (BPJ) determination.

The State has similar technology-based limits which are described as: "all known, available and reasonable methods of control, prevention, and treatment" (AKART) methods. AKART is referred to in State law under RCW 90.48.010, RCW 90.48.520, 90.52.040 and RCW 90.54.020. The Federal technology-based limits and AKART are similar but not equivalent. AKART: (1) may be established for an industrial category or on a case-by-case basis; (2) may be more stringent than Federal regulations; and (3) includes not only treatment, but also BMPs such as prevention and control methods (i.e. waste minimization, waste/source reduction, or reduction in total contaminant releases to the environment). The Department and the Federal Environmental Protection Agency (EPA) concur that, historically, most discharge permits have determined state AKART as equivalent to federal BPJ determinations.

The pesticide application industry has been regulated by EPA under the terms of FIFRA. Pesticide use is regulated by label use requirements developed by EPA. In developing label use requirements, EPA requires the pesticide manufacturer to register each pesticide and provide evidence that the pesticide will work as promised and that unacceptable environmental harm will be minimized.

It is the intent of this general permit to authorize the noxious weed control activities mandated by the state legislature in a manner that also complies with federal and other state requirements.
The state statute that requires AKART also requires control of noxious weeds. The Washington State legislature declared in SB5670 (1999), prior to the Talent decision that

"(1) the director shall issue or approve water quality permits for use by federal, state, or local governmental agencies and licensed applicators for the purpose of using, for aquatic noxious weed control, herbicides and surfactants registered under state or federal pesticide control laws, and for the purpose of experimental use of herbicides on aquatic sites, as defined in 40 C.F.R. Sec. 172.3. The issuance of the permits shall be subject only to compliance with: Federal and state pesticide label requirements, the requirements of the federal insecticide, fungicide, and rodenticide act, the Washington pesticide control act, the Washington pesticide application act, and the state environmental policy act, except that:

(a) When the director issues water quality permits for the purpose of using glyphosate and surfactants registered by the department of agriculture to control spartina, as defined by RCW 17.26.020*, the water quality permits shall contain the following criteria:*

(i) Spartina treatment shall occur between June 1st and October 31st of each year unless the department, the department of agriculture, and the department of fish and wildlife agree to add additional dates beyond this period, except that no aerial application shall be allowed on July 4th or Labor Day and for ground application on those days the applicator shall post signs at each corner of the treatment area;

(ii) The applicator shall take all reasonable precautions to prevent the spraying of nontarget vegetation and nonvegetated areas;

(iii) A period of fourteen days between treatments is required prior to re-treating the previously treated areas;

(iv) Aerial or ground broadcast application shall not be made when the wind speed exceeds ten miles per hour; and

(v) An application shall not be made when a tidal regime leaves the plants dry for less than four hours.

(b) The director shall issue water quality permits for the purpose of using herbicides or surfactants registered by the department of agriculture to control aquatic noxious weeds, other than spartina, and the permit shall state that aerial and ground broadcast applications may not be made when the wind speed exceeds ten miles per hour.

(c) The director shall issue water quality permits for the experimental use of herbicides on aquatic sites, as defined in 40 C.F.R. Sec. 172.3, when the department of

agriculture has issued an experimental use permit, under the authority of RCW 15.58.405(3). Because of the small geographic areas involved and the short duration of herbicide application, water quality permits issued under this subsection are not subject to state environmental policy act review.

(2) Applicable requirements established in an option or options recommended for controlling the noxious weed by a final environmental impact statement published under chapter 43.21C RCW by the department prior to May 5, 1995, by the department of agriculture, or by the department of agriculture jointly with other state agencies shall be considered guidelines for the purpose of granting the permits issued under this chapter."

And later,

"(4) As used in this section, "aquatic noxious weed" means an aquatic weed on the state noxious weed list adopted under RCW 17.10.080."

All WWDPs issued by the department must incorporate requirements to implement reasonable prevention, treatment and control of pollutants.

The legislature established in the Washington Pesticide Control Act, RCW 17.15, that prevention of pollution in this case is reasonable only in the context of an Integrated Pest Management Plan. IPMs require the investigation of all control options, but do not require nonchemical pest controls as the preferred option. The goal of IPMs is to establish the most effective means of control whether chemical, nonchemical, or a combination. Most noxious weed control strategies are such a combination.

The Talent decision established that aquatic pesticides become waste in the water after the pesticide has performed its intended action and the target organisms are controlled. Treatment of the pollutants addressed in this permit is difficult due to the diffuse nature and low concentrations that exist after the pesticides have become waste.

Control of the pollutants addressed in this permit has been demonstrated previously in isolated situations where a routine application of the preferred pesticide may have caused unwanted impacts on nontarget organisms. Underwater curtains and other barriers have been used to isolate the area of pesticide application when downstream water users raise concerns or sensitive native plants or fisheries share the waterbody. However, the state legislature clearly intended to limit noxious weed control to FIFRA label requirements and the PCA. Control of pesticides by use of barriers will not be required unless triggered by FIFRA requirements or other local concerns

The Washington State Department of Agriculture (WSDA) occasionally authorizes experimental use of pesticides not yet registered for a particular use or application rate. These experimental projects are usually small in scope and infrequent. The permit allows experimental use in aquatic environments in order to promote alternatives that may be more effective while reducing impacts to nontarget organisms.

The WSDA is responsible for issuing experimental use permits for pesticides in Washington State. A Washington State Experimental Use Permit (WSEUP) is required for all experiments involving pesticides that are not federally registered or uses not allowed on the federally registered pesticide label. Limited amounts of an experimental use pesticide may only be distributed or used for testing purposes after a written permit has been obtained from WSDA for purposes which include gathering data in support of registration under FIFRA Section (3) or Section 24(c).

In most situations only a state WSEUP is required for the use of an experimental pesticide. A federal EUP is required when a small-scale test will be conducted on a cumulative total of more than 10 acres of land per pest on terrestrial sites or on more than one surface acre of water per pest. When testing for more than one target pest at the same time and in the same locality, the 10-acre limitation shall encompass all of the target pests. Any person may apply to the EPA for a federal experimental use permit for pesticides, which are usually valid for only one year. Applicants holding a valid federal experimental use permit must also apply for and be granted a state experimental use permit before initiating any shipment or use of the pesticide in Washington.

WATER QUALITY BASED REQUIREMENTS

The noxious and quarantine weed control activities affect surface waters of the State. These waters are protected by chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington.

The noxious weed control activities which discharge to surface waters will be required to meet the State water quality standards for Class A and Class AA surface waters as given in chapter 173-201A WAC. The characteristic beneficial uses of Class AA and A surface waters include, but are not limited to, the following: domestic, industrial and agricultural water supply; stock watering; the spawning, rearing, migration and harvesting of fish; the spawning, rearing and harvesting of shellfish; wildlife habitat; recreation (primary contact, sport fishing, boating, aesthetic enjoyment of nature); commerce and navigation.

RCW 90.48.035 authorizes establishment of water quality standards for waters of the State. The State has implemented water quality standards in chapter 173-201A WAC. All waste discharge permits issued pursuant to NPDES or SWD regulations are conditioned in such a manner that all authorized discharges shall meet State water quality standards. Standards include an "antidegradation" policy which states that beneficial uses shall be protected.

Discharges from noxious weed control activities may contain pollutants which, in excessive amounts, would have a reasonable potential to cause, or contribute to, violations of State water quality standards due to the presence of toxic materials. The Department has deemed that, when properly applied and handled in accordance with the terms and conditions of the general permit, noxious weed control activities will comply with State water quality standards, will

maintain and protect the existing characteristic beneficial uses of the surface waters of the State, and will protect human health. New information regarding previously unknown environmental and human health risks may cause reopening of the general permit.

No mixing or dilution zone shall be authorized to the Permittee for any discharge to surface waters under this general permit. The short term water quality modification provisions of the permit will allow the discharges authorized by the general permit to cause a temporary diminishment of some beneficial uses while the water body is altered to improve other beneficial uses.

The activities authorized by this general permit do not have a reasonable potential to cause a violation of state water quality standards (WAC 173-201A) so long as the activities are allowed under the short term water quality modification. The water quality modification provides for an exception to meeting certain provisions of the state water quality standards such as meeting all beneficial uses all the time. Activities covered under this permit are allocated a temporary zone of impact on beneficial uses, but the impact must be transient, and must allow for full restoration of water quality and protection of beneficial uses upon project completion. The conditions of the permit constitute the requirements of a water quality modification.

Washington's water quality standards now include 91 numeric human health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge does not contain chemicals in concentrations of concern for human health based on existing data or knowledge. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

Sediment Quality

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

A 3-year study to assess the short- and long-term fate and potential effects to marine biota associated with repeated applications of Rodeo® to control smooth cordgrass was conducted in a southwestern Washington estuary. At each of three intertidal locations in Willapa Bay, plots were established on exposed mudflats and along the edge of a spartina meadow that were hand sprayed with Rodeo® (5% solution) and LI-700® (2% solution) during July 1997 and 1998.

Glyphosate concentrations in sediment from bare mudflat plots declined 88% to 96% from 1 day post-treatment in 1997 to 1 year after the second Rodeo® applications in 1999. In contrast, glyphosate concentrations in spartina plots increased 231% to 591% from 1997 to 1999 because spartina rhizomes likely held the glyphosate in tissue and did not readily metabolize or exude it. Comparison of concentrations from mudflat and spartina plots with toxicity test values for marine biota indicates that under worst-case conditions short- and long-term detrimental effects to aquatic biota from repeated application of Rodeo® for spartina control would be highly unlikely."(Kilbride and Paveglio)

SEPA COMPLIANCE

Noxious weed control activities have undergone numerous environmental impact evaluations. The use of pesticides is conditioned to mitigate environmental impacts of concern noted in these evaluations.

RECEIVING WATER IDENTIFICATION

Geographical Area of Coverage

Government agencies are required to be covered by the general permit for the following noxious weed herbicide activities which occur in surface waters of the state:

1) Into waterbodies that are contiguous with rivers, creeks, and lakes, or
2) Into navigable waters, or
3) In other situations as determined by the department.

Noxious weeds have the potential to occur in or near virtually any freshwater aquatic or semi-aquatic site in Washington State. These sites include but are not limited to riparian areas, wetlands, marshes, rivers, year round and seasonal streams, lakes, ponds, wet pastures and brackish estuaries. It is vital that new infestations be controlled, wherever they are found, to ensure they do not spread and become much larger problems.

Spartina control locations have been identified in the spartina control management plan for each waterbody. Herbicide applications could potentially occur at all infestations identified in the management plans. Approximate infestation locations have been identified in the management plans for each water body. At this time infestations occur in Pacific, Grays Harbor, Clallam, Jefferson, Kitsap, King, Snohomish, Island, Skagit and San Juan Counties. If new infestations are discovered, the locations will be added to the management plan. New infestations may arise during the course of the permit at which herbicide applications must be an option. Any newly discovered infestations will be added to the management plans.

Submersed noxious weed control locations are indicated in the applications for coverage where the locations are known and planned. Additional lakes or locations may be found that need early infestation treatment. Although the lakes may not be listed on the application for coverage, neighboring property owners will still be notified according to the permit and label required procedures.

Known purple loosestrife locations are included in Appendix B – Noxious Weed Details.

Some noxious weed control situations are a low priority because of minimal environmental impact when herbicides are applied according to the FIFRA label, particularly when compared with the desirability of noxious weed control. These situations are derived in part from exclusions to the definition of "waters of the United States" in 33CFR Part 328.3. These include:

1) On land which is in agricultural use where the noxious weed control is performed where treatment would have no environmental impact except to noxious weeds, or
2) In man-made retention or detention ponds for wastewater or stormwater treatment, or
3) Where herbicide applications are directed onto noxious weeds in a terrestrial setting and not into surface waters.

These situations are described so that the department and other government agencies are not burdened by oversight and permit requirements in situations where a permit would add no additional environmental protection of beneficial uses. The department prefers to focus on the more significant water quality threats for permitting as opposed to the less significant ones that won't adversely affect water quality or related habitat.

CHARACTERIZATION OF HERBICIDE CONCENTRATIONS

TABLE 1. PERMITTED HERBICIDES USED FOR NOXIOUS WEED CONTROL

Product Name	Active Ingredient	Active ingredient use rate	Active ingredient concentration in treated waters	Use
DMA 4 IVM liquid	2,4-Dichrophenoxyacetic acid, dimethylamine salt	5.4 to 10.8 pounds/acre foot	2 to 4 ppm	Applied as a liquid into the water
Navigate Granular	2,4-Dichrophenoxyacetic acid, butoxyethyl ester	19 pounds/acre	2-4 ppm	Applied as a granular pellet into the water
Sonar SRP granular, Sonar AS liquid, Avast	Fluridone: 1-methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4(1H)-pyridinone	0.05 to 0.25 pounds/acre foot	20 ppb to 90 ppb	Applied as a granular pellet or liquid into the water
Aquatholl K Liquid, Aquatholl Granular, Aquatholl Super K Granular	Endothall: Dipotassium salt of 7-oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	5.5 to 11 pounds/acre foot	2 ppm to 4 ppm	Applied as a liquid or granular pellet into the water
Rodeo Aqua Pro	Glyphosate: N-(phosphonomethyl) glycine, isopropylamine salt			Sprayed on plants, not into water
LI 700	Phosphatidylcholine, methylacetic acid and alkyl polyoxyethylene ether	Total spray volume of adjuvant not to exceed 5%		surfactant

Product Name	Active Ingredient	Active ingredient use rate	Active ingredient concentration in treated waters	Use
Pro-Spreader Activator	Nonylphenoxy polyethoxy ethanols, isopropanol and Fatty acids			surfactant

PROCEDURE FOR APPROVAL OF PRODUCTS NOT SPECIFIED IN THE CURRENT PERMIT

The industry indicated that they might lose the use of some pesticides in the current EPA re-registration process and were concerned about the length of time necessary to do a permit modification to allow the use of alternatives not yet approved. In response to this concern the permit allows use of other pesticides after approval through EPA FIFRA and completion of a multi-agency State Environmental Policy Action

The pesticides that may satisfy this requirement after permit issuance are Diquat (Reward©) which could be used for Brazilian elodea, Imazapyr (Arsenal©) possibly for spartina, and Triclopyr (Revovate©) for purple loosestrife and milfoil.

OTHER PERMIT CONDITIONS

MONITORING

Monitoring of residual pesticides may be required to confirm assumptions of persistence when applications are performed in compliance with the pesticide label. The permittee may propose and gain approval for a monitoring plan in lieu of monitoring each application for whole lake herbicide applications, herbicide applications near drinking and stock watering water withdrawal sites, where native vegetation or threatened or endangered species are likely to be affected, or applications to sites where the total area of treatment exceeds ten acres. The intent is to gather information to confirm the assumptions of persistence and toxicity relative to the rate of application. This information may better define the period of temporary diminishment of beneficial uses. Monitoring will not be required during the first year of this permit cycle. The timing of the effective date of the permit is too late into the season to allow thoughtful annual monitoring plan submittal and review. It is hoped that the experience and voluntary monitoring of the first season under an NPDES permit will eventually produce more meaningful monitoring plan development in subsequent years.

REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-226-090).

INTEGRATED PEST MANAGEMENT PLANS

By developing integrated vegetation management plans, the permittee should continue to examine the possibility of alternatives to reduce the need for aquatic pesticides. If aquatic herbicides are selected as one of the control options, the permittee should ensure that:

- Herbicides are used only after the assessment of all available control technologies,
- Site-specific action thresholds for aquatic plant removal are determined,
- The herbicides used are the least toxic chemicals at use levels to non-targeted organisms ,
- The least amount of the herbicide needed to effectively control the noxious weed is added to the waterbody, and
- The latest chemical control technologies are considered and utilized.

Once a decision has been made to use aquatic herbicides to manage aquatic plants through the IPM process, the herbicide appropriate to the site and targeted plant is selected. The selection of the herbicide or herbicide formulation may depend on variables such as water exchange, presence of endangered species, areal coverage and density of the targeted plant, susceptibility of the targeted plant to that particular herbicide, water chemistry, etc. The herbicide that has the least toxic impacts to non-target organisms, but is still highly effective in controlling the targeted species should be used. Ecology's updated Final Supplemental Environmental Impact Statement for Freshwater Aquatic Plant Management provides guidance on herbicide toxicity, impacts, and mitigation.

Once the appropriate aquatic herbicide has been selected, the least amount of herbicide needed to effectively control the targeted plant should be used. The herbicide label often recommends rates to control the targeted species, but often knowledge of the latest research provides the most up to date information about effective herbicide rates using the least amount of herbicide. In addition new testing procedures have been developed for some chemicals that allow the target plants to be tested for susceptibility to the herbicide so that the lowest effective herbicide rates can be used. By following the above procedures the least amounts and the least toxic herbicides that will effectively control the target weed can be used

PERMIT COVERAGE CONDITIONS

The conditions for coverage under the general permit are derived from state regulation at WAC 173-226.

Unless the Department either desires to respond in writing to any facility's Application for Coverage or obtains relevant written public comment, coverage under this general permit of such a facility will commence on the later of the following:

- The thirty-first (31st) day following receipt by the Department of a completed and approved Application for Coverage;
- The thirty-first (31st) day following the end of a thirty (30) day public comment period; or
- The effective date of the general permit.

If the Department desires to respond in writing to any facility's Application for Coverage or obtains relevant written public comment, coverage under this general permit of such a facility will not commence until the Department is satisfied with the results obtained from written correspondence with the individual facility and/or the public commenter.

PERMIT MODIFICATIONS

The Department may modify this permit to impose new or modified numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, or Department approved engineering reports. The Department may also modify this permit as a result of new or amended state or federal regulations.

POSTING REQUIREMENTS

The requirements for public notice, posting, and legal notice of pesticide applications are adopted from previous public notification requirements in department issued orders and short term modifications. In some cases, the public notification requirements were based on EPA FIFRA label requirements.

RESPONSIBILITY TO COMPLY WITH OTHER REQUIREMENTS

The Department has established, and will enforce, limits and conditions expressed in the general permit for the discharge of wastestreams containing various pesticides registered for use by the EPA and the Washington State Department of Agriculture. These agencies will

enforce the use, storage and disposal requirements expressed on pesticide labels. The Permittee must comply with both the pesticide label requirements and the general permit conditions. The general permit does not supersede or preempt Federal or State label requirements or any other applicable laws and regulations. General permit Condition G11 reminds the Permittee of this fact.

GENERAL CONDITIONS

General conditions are based directly on State and Federal law and regulations and are included in all aquatic pesticide general permits.

RECOMMENDATION FOR PERMIT ISSUANCE

The general permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that the general permit be issued for five (5) years.

APPENDIX A – PUBLIC OPPORTUNITY FOR COMMENT

PUBLIC COMMENT AND INFORMATION

A Public Notice of Draft (PNOD) was published in the State Register on February 6, 2002. Three public hearings on the draft General Permit will be held at least thirty (30) days after the date of the public notice. The first hearing will be held March 11 in the city of Yakima at the Department of Ecology. The second hearing will be held March 14 in the city of Lacey. The final hearing will be held on March 25 in the city of Spokane. A workshop to explain proposed changes and answer questions is held immediately preceding both hearings.

Interested persons are invited to submit comments regarding the proposed issuance of the General Permit. Comments on the general permit may be given at the public hearings as either written or oral testimony. Written comments may also be submitted to the Ecology Office at the address below:

Washington State Department of Ecology
Headquarters Building, Lacey
Attention: Kathleen Emmett
P.O. Box 7600
Olympia, WA 98504-7600

All comments must be submitted by 5 p.m. on March 25 to be considered in the final permit determination. A responsiveness summary will be prepared and available for public review. It will be sent to all parties who submit comments by the deadline.

The proposed general permit, fact sheet, application form, and other related documents are on the internet at http://www.ecy.wa.gov/programs/wq/herbicides/index.html**.** They may also be inspected and copied between the hours of 8:00 a.m. and 4:30 p.m. weekdays at the following Washington Department of Ecology regional locations:

Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902
(509) 454-7298
TDD (509) 454-7673
FAX (509) 575-2809
Contact: Ray Latham

Eastern Regional Office
North 4601 Monroe, Suite 202
Spokane, WA 99205
(509) 456-2874
TDD (509) 458-2055
FAX (509) 456-6175
Contact: Nancy Weller

Southwest Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902
(509) 454-7298
TDD (509) 454-7673
FAX (509) 575-2809
Contact: Carrie Carroll

Northwest Regional Office
North 4601 Monroe, Suite 202
Spokane, WA 99205
(509) 456-2874
TDD (509) 458-2055
FAX (509) 456-6175
Contact: Tricia Shobloom

APPENDIX B – NOXIOUS WEED DETAILS

Need for Noxious Weed Control

Aquatic herbicide application is often needed to remove non-indigenous, invasive weeds from our lakes, rivers, shorelines, and estuaries. The impacts of these species are significant and pervasive and they have profound impacts on species diversity, habitat, water quality, recreation, water supply, drinking water, flood control, safety, and health. Many invasive aquatic species have been placed on Washington State Noxious Weed List and many are mandated for eradication/control. When noxious weeds become widespread within a waterbody often aquatic herbicides are the most effective tools to remove these plants and restore the ecosystem.

Noxious plants are not native to Washington. They were often introduced without the natural predators/diseases that keep their populations in check within their native ranges. The problematic aquatic species in Washington generally form dense single species stands that exclude and outcompete native aquatic plants. Some species, such as Eurasian watermilfoil and purple loosestrife, are somewhat unpalatable and provide less food for our waterfowl and aquatic animals than do native species. Milfoil has also been shown to support less invertebrates than does a healthy native plant community.

World-wide invasive non-indigenous species are second only to habitat loss in contributing to the extirpation and eradication of native species. A study in a New York lake documented the loss of species within a diverse plant community when milfoil invaded the lake. A consultant working in Pend Oreille County reported to the State Weed Board that the yellow iris is displacing six rare and threatened wetland species.

Research by the University of Washington and others has demonstrated that dense stands of mat-forming weeds such as milfoil and the fragrant waterlily can alter water quality in lakes. The dense vegetation blocks wind from mixing surface oxygenated waters throughout the water column. Often extremely low oxygen conditions develop under these mats. Juvenile steelhead suspended in cages within milfoil mats in Lake Washington did not survive in the deeper, less oxygenated waters. The high photosynthesis rate on the surface may increase the pH to over 10. The mats slow water movement and the surface temperatures become much warmer than the underlying water. The low oxygen conditions may also lead to increased phosphorus release from the sediments as the sediments become anaerobic. The increased phosphorus loading can lead to algal blooms. The vegetation mats slow water movement and organic material tends to build up underneath them, thus enhancing the rate of sediment accumulation and accelerating the life cycle of the lake. Generally native aquatic plants form a more open community allowing more wind mixing to occur.

Noxious submersed aquatic weeds impact the fishery by altering water quality and provide so many hiding places for prey fish that predator fish, like bass, form stunted populations. They also hinder anglers by tangling fishing lines and lures and making boating difficult. At Rocky Reach dam, dense milfoil beds interfere with migrating salmon usage of fish ladders. There is speculation that milfoil may be impacting salmon in the Columbia River by forcing the juveniles

to migrate along the edges of the beds where they are more vulnerable to predators. Parrotfeather in the Chehalis River has completely blocked backwater areas and side channels that are normally good salmon rearing habitat. Reed canarygrass infestation is frequently sited as major contributor to blockage of salmon streams.

Impacts to recreation from noxious aquatic weeds are significant. Boats are unable to move through dense beds without stopping every minute or so to remove plants from their propellers. Sailboat owners report that they are physically unable to leave their boat moorage because of the dense milfoil beds in Lake Washington marinas in mid-summer. Swimmers have panicked and drowned in dense plant stands. Lifeguards consider any aquatic plant within swimming areas to be a safety hazard because they are unable to see the swimmers underwater and rescue is difficult.

In our rivers, fragmenting milfoil plants impact power generation by clogging trash racks. Water intakes for irrigation and water supply can become plugged causing pumps to burn out. An infestation of Brazilian elodea in a drinking water reservoir in Newport Oregon produces chemicals that react with water treatment to produce carcinogens. The sheer mass of noxious weeds displaces water and can cause flooding to occur. Stagnant water produced in the mats is an excellent breeding ground for mosquitoes.

Eradicating noxious weeds or keeping their populations at low levels can restore native plant communities to pre-invasion conditions.

Spartina

Spartina is one of the most aggressive and ecologically damaging noxious weeds subject to control under this permit. "Through a variety of accidental and intentional mechanisms, cordgrasses (*Spartina* spp.) were established in estuaries along the West Coast of North America. *S. alterniflora*, *S. anglica*/*S. townsendi*, *S. densiflora*, and *S. patens* exhibit superior production, growth, and colonization rates compared with native low salt marsh species from San Francisco Bay (Calloway and Josselyn 1992) to coastal Oregon (Frenkel and Boss 1988) and Washington (Frenkel 1987). The largest infestation of nonnative spartina on the West Coast is *S. alterniflora* in Willapa Bay that occupies approximately 6,000 hectares (32%) of the intertidal zone (Reeves 1999). The *S. alterniflora* infestation in Willapa Bay is expected to occupy 11,000 ha by 2004 (Harrington and Harrington 1993). In western Washington, *S. alterniflora*, *S. anglica*, and *S. patens* currently infest approximately 8,100 ha of estuarine habitat (Reeves 1999). The intertidal zone mudflats displaced by spartina are critical habitat for migratory birds, salmonids, eelgrass (*Zostera* spp.), and clams (Proctor et al. 1980).

Changes associated with spartina also impact recreation. Loss of beach habitat and navigation routes, reduced water access, and other alterations to the estuarine ecosystem may result from the spread of *S. anglica*. Therefore, activities, such as fishing, hunting, boating, bird watching, botanizing, and shellfish harvesting, that are dependent on the extant intertidal ecosystem could be negatively impacted by the continued spread of spartina (Ebasco Environmental 1993).

Populations are also found in Grays Harbor County in the Copalis River estuary and at Damon Point in Grays Harbor. In addition, the plant has invaded areas of Puget Sound and the Strait of Juan de Fuca, including: Sequim Bay (Clallam County), Thorndyke Bay and Kala Point (Jefferson County), and Padilla Bay (Skagit County) (Adopt a Beach, unpublished data; Ebasco Environmental 1992). As of 1991, 19 *S. alterniflora* stands covered an estimated 48,100 m^2 in Padilla Bay (Riggs 1992).

Response to Mechanical Control Methods: Seedlings can be pulled out effectively. Care must be taken to remove both shoots and roots. Seedlings generally begin tillering late in their first growing season. Once the plant has tillered, hand-pulling may break off portions of root, allowing the plant to resprout. Repeated pullings will eventually kill small plants (Spartina Task Force 1994). However, pulling or digging established clones is difficult and largely ineffectual. Findings from attempts to remove a 1 by 2 m clone in Willapa Bay indicate it is difficult to remove all roots and rhizomes, and the amount of wet mud that is removed in the digging process makes the technique unmanageable (Aberle 1990)

Covering small spartina clones with woven geotextile fabric has been successful in some areas. With this technique, clones are mown to ground level and covered out 3 to 4 feet beyond the edges of the clone. The covering must be anchored in place. To be effective, covering should be left in place for one to two growing seasons. This method is most suitable for small infestations. (Spartina Task Force 1994).

Mowing infestations can contain growth, limit seed set, and eventually kill the plants. To be effective, clones must be mowed repeatedly, beginning with initial spring green-up and continued until fall die-back. For clones under 10 feet in diameter, one to three mowings during the growing season may be effective. Larger clones need to be mowed nine to ten times over two seasons for eradication. In some cases, mowing will be required for a third or fourth year (Spartina Task Force 1994).

Response to Herbicides: Rodeo™ (glyphosate) is the only herbicide presently labeled for use on *Spartina alterniflora* in Washington. Reports of control with Rodeo™ are varied, ranging from 100% (Crockett 1991) to 0% (Balthuis and Scott 1993). Differences in reported control results may be due to the use of different surfactants. *S. alterniflora* leaves have high levels of salt and sediment, which may prevent glyphosate absorption. Finding an adjuvant that overcomes the effects of these antagonistic ions is likely to increase Rodeo™ absorption (Norman and Patten 1994c). Additional research is needed on this front.

Research is currently being carried out on the efficacy of simulated aerial spraying and hand-held wiping treatments. Simulated aerial spraying has not been highly effective, perhaps due to the lack of an effective surfactant. Hand-held wiping treatments have had better results. Wiping treatments in May are ineffective, but Rodeo™ (33%, v/v) applied with 5 percent LI 700 in June, July or August has provided over 90 percent control (Norman and Patten 1994a).

Bio-Control Potentials: *Spartina alterniflora* was introduced to Washington without any of the insect predators that damage it in its native range. Insects native to the Pacific Northwest cause little damage to the species, resulting in plants that average greater vigor and stature than specimens within the species' native range (Strong 1990).

A leafhopper, *Prokelisia marginata* (Homoptera), has been suggested as a potential biocontrol agent for Spartina (Ebasco Environmental 1992c). *Prokelisia* occurs on *S. alterniflora* populations on the East Coast and in San Francisco Bay. It is unclear whether *Prokelisia* is indigenous to California, where it occurs on the native *S. foliosa*, as well as *S. alterniflora* (Ebasco Environmental 1992c; Daehler and Strong 1994). The insect feeds on phloem, and it may limit seed production or affect the rate of vegetative spread (Bertness and Shumway 1992; Daehler and Strong 1994). However, research indicates that the insect does not limit viable seed production in San Francisco Bay. More studies are needed to determine what impact the insect may have on vegetative spread, since phloem feeders have been known to decrease tillering rates in some grasses (Daehler and Strong 1994).

The ergot fungus, *Claviceps purpurea*, also has potential as a biocontrol agent. Ergot occurs on Spartina in the southeastern U.S. and has also been observed in Willapa Bay (Gessner 1978; Ebasco Environmental 1992c). Ergot infects flower parts and replaces grain with sclerotia (a hardened mass of filaments), which could potentially reduce seed production (Ebasco Environmental 1992c). Ergot infects many other grasses besides Spartina, including rye, wheat, barley, and oats. Therefore, any biocontrol strain would need to be host-specific to Spartina (Ebasco Environmental 1992c). The spartina ergot fungus that occurs in the Southeast is chemically different than ergots found on other hosts and may be a different biotype (Gessner 1978). More research is needed before ergot could be used for biocontrol in Washington.

Rationale for listing as a noxious weed: *Spartina alterniflora* is an aggressive exotic salt marsh plant that has already colonized a significant portion of the intertidal zone in Willapa Bay. Substantial sections of Puget Sound are also vulnerable to colonization by this species. *S. alterniflora* invasions in Washington bring about change to the intertidal zone (Simenstad and Thom 1995). While the exact ecological and economic consequences of these changes is uncertain, the potential for damage is extensive

EURASIAN WATERMILFOIL (*Myriophyllum spicatum*)

A number of milfoil species occur in Washington State and many of these species are very similar to each other in appearance. Eurasian watermilfoil looks so much like its native relative *Myriophyllum sibericum* that it was once thought to be a variety of that species. Often, even milfoil experts must rely on pigment or DNA analysis to distinguish milfoil species from each other. Like many milfoils, Eurasian watermilfoil is a submersed perennial plant with finely dissected feather-like leaves. The leaves are arranged in whorls of 4 (rarely 5) around the stem at each node. Each Eurasian watermilfoil leaf generally has 12 or more leaflet pairs and this feature can be used about 70 percent of the time to distinguish Eurasian watermilfoil from

other milfoil species. However, the number of pairs of leaf divisions are very variable and can range from 5 to 24. Young plants and free floating plant fragments often develop leaves with fewer than 14 divisions.

The growing stem tips of Eurasian watermilfoil (and other milfoil species) are tassel-like and often red; especially early in the growing season. Tiny pinkish flowers occur on reddish spikes that stand several inches above the water and submerge when pollination is complete. The stem width of Eurasian watermilfoil almost doubles below the inflorescence. Lower flowers are pistillate, upper flowers staminate. Seeds are produced, but seedlings are rare in nature. In situations where water evaporates slowly and the plants gradually become stranded, Eurasian watermilfoil can develop into a land form. The leaves of the land form are smaller, stiffer, and have fewer divisions. If such plants are submerged, new growth with aquatic leaves develops in 7-10 days, but the first leaves formed have relatively few divisions and only later does the number of divisions increase to more than 12 leaflet pairs.

Eurasian watermilfoil adversely impacts aquatic ecosystems by forming dense canopies that often shade out native vegetation. Monospecific stands of Eurasian watermilfoil provide poor habitat for waterfowl, fish, and other wildlife. Significant rates of plant sloughing and leaf turnover, as well as the decomposition of high biomass at the end of the growing season, increase the internal loading of phosphorus and nitrogen to the water column. Dense Eurasian watermilfoil mats alter water quality by raising pH, decreasing oxygen under the mats, and increasing temperature. In eastern Washington, Eurasian watermilfoil impacts power generation and irrigation by clogging dam trash racks and intake pipes.

Stagnant water created by Eurasian watermilfoil mats provides good breeding grounds for mosquitoes. Eurasian watermilfoil interferes with recreational activities such as swimming, boating, fishing and water skiing. In Washington, private and government sources spend about $1,000,000 per year on Eurasian watermilfoil control. Other states and provinces (Minnesota, Wisconsin, Vermont, New York, and British Columbia) spend similar amounts per year to control Eurasian watermilfoil infestations.

Eurasian watermilfoil is native to Europe, Asia, northern Africa, and also occurs in Greenland. Eurasian watermilfoil is mainly a problem plant in North America, but it has been reported from Australia. In North America, Eurasian watermilfoil is found from Florida to Quebec in the east, and California to British Columbia in the west. It appears to be primarily spread from waterbody to waterbody through boating activity, although anglers have been known to deliberately plant this species in lakes. A number of populations found in Oklahoma were introduced by earthworm farmers who packed their product in Eurasian watermilfoil.

Eurasian watermilfoil is an extremely adaptable plant, able to tolerate and even thrive in a variety of environmental conditions. It grows in still to flowing waters, can tolerate salinities of up to 15 parts per thousand (half the salinity of Puget Sound), grows rooted in water depths from 1 to 10 meters (regularly reaching the surface while growing in water 3 to 5 meters deep), and can survive under ice. It is able to tolerate pHs from 5.4-11. Relative to other

submersed plants, Eurasian watermilfoil requires high light, has a high photosynthetic rate, and can grow over a broad temperature range. Eurasian watermilfoil grows best on fine-textured, inorganic sediments and relatively poorly on highly organic sediments. Over the spectrum of infertile to enriched aquatic systems, Eurasian watermilfoil appears to prefer an approximate mid-point, although it occurs in ultra-oligotrophic lakes like Lake Chelan, Washington and hyper-eutrophic lakes like Carlisle Lake, Lewis County, Washington.

Eurasian watermilfoil may have been introduced to the North American continent at Chesapeake Bay in the 1880s, although Couch and Nelson present evidence that the first collection of Eurasian watermilfoil was made from a pond in the District of Columbia during the fall of 1942. By 1985, Eurasian watermilfoil had been found in 33 states, the District of Columbia, and the Canadian provinces of British Columbia, Ontario, and Quebec. The first known record of Eurasian watermilfoil in Washington is from a 1965 herbarium specimen collected from Lake Meridian, King County. However, state officials first became aware of Eurasian watermilfoil as a problem plant in 1974 when Eurasian watermilfoil moved downstream from the Canadian Okanogan Lake Chain into Lake Osoyoos, despite government efforts to halt its downstream spread. From Osoyoos, Eurasian watermilfoil moved downstream into the Okanogan River and the Columbia River. It was also introduced into the Pend Oreille River and by 1995, Eurasian watermilfoil was found in lakes near these rivers. In western Washington Eurasian watermilfoil was found in Lake Washington in 1974 and from there Eurasian watermilfoil has spread along the Interstate 5 corridor into many western Washington lakes.

Eurasian watermilfoil exhibits an annual pattern of growth. In the spring, shoots begin to grow rapidly as water temperatures approach 15 degrees centigrade. When they near the surface, shoots branch profusely, forming a dense canopy. The leaves below 1 meter senesce in response to self-shading. Typically, plants flower upon reaching the surface (usually in mid to late July). After flowering, plant biomass declines as the result of the fragmentation of stems. Where flowering occurs early, plant biomass may increase again later in the growing season and a second flowering may occur. During fall, plants die back to the root crowns, which sprout again in the spring. In some areas, like western Washington, Eurasian watermilfoil frequently overwinters in an evergreen form and may maintain considerable winter biomass. Eurasian watermilfoil plants do not form specialized overwintering structures such as turions. Carbohydrate storage occurs throughout overwintering shoots and roots.

Although Eurasian watermilfoil can potentially spread by both sexual and vegetative means, vegetative spread is considered the major method of reproduction. In Lake George, New York a young population of Eurasian watermilfoil averaged a seed set of 112 seeds per stalk. Eurasian watermilfoil seeds readily germinate in the laboratory and also germinated *in situ* in a study conducted in Lake George. Despite the high seed production, it is thought that germination of seed is not a significant factor in Eurasian watermilfoil reproduction. Seedlings have never been observed occurring naturally *in situ*, therefore colonization of new sites is mainly by vegetative fragments. During the growing season, the plant undergoes autofragmentation. The abscising fragments often develop roots at the nodes before separation

from the parent plants. Fragments are also produced by wind and wave action and boating activities, with each fragment having the potential to develop into a new plant. Once introduced, Eurasian watermilfoil also may spread rapidly. In Currituck Sound, North Carolina, Eurasian watermilfoil was first reported in 1965 when approximately 40 hectares were densely infested and 200 to 400 hectares were lightly infested. A year later 3,200 hectares were heavily infested and 26,800 hectares had some milfoil plants. Nine years later, over 32,000 hectares were infested with Eurasian watermilfoil.

Response to Herbicides

Westerdahl and Getsinger report excellent control with 2,4-D, diquat, diquat and complexed copper, endothall dipotassium salt, and endothall and complexed copper. They report good control with fluridone. In Washington, fluridone (brand name Sonar®) has been successfully used to eradicate Eurasian watermilfoil in Steel Lake, King County; Goss Lake, Island County; and Carlisle Lake, Lewis County. In other lakes where eradication using Sonar® was attempted, generally all but a few milfoil plants remained. To be effective, fluridone concentrations of 10-15 ppb must be maintained in the water column for 10 to 12 weeks. Follow-up diver surveillance and hand-pulling of surviving plants is essential to the success of this technique. Some eradication attempts with fluridone have had mixed success in Washington. Factors such as surface and ground water inflows and development of land forms of Eurasian watermilfoil all affect the success rate. The herbicide triclopyr is undergoing federal aquatic registration and holds great promise for Eurasian watermilfoil control. Unlike fluridone, triclopyr requires a short contact time (18 to 48 hours) and will selectively control Eurasian watermilfoil while leaving many native aquatic plants relatively unaffected. Of the above herbicides, endothall, fluridone, 2,4-D, and copper are permitted for aquatic use in Washington waters, but copper is generally permitted only for algae control.

Response to Cultural Methods

Localized control (in swimming areas and around docks) can be achieved by covering the sediment with an opaque fabric which blocks light from the plants (bottom barriers or screens). Managers of reservoirs and some lake systems may have the ability to lower the water level as a method of managing aquatic plants. The Tennessee Valley Authority (TVA) uses both winter and summer water level drawdowns as effective way of reducing Eurasian watermilfoil biomass. They find that a drawdown of about 2 meters is effective in reducing excessive populations. Short-term dewatering for 2-3 days during period of freezing temperatures has been effective, but multiple exposures may improve control. A 1-week drawdown of a large TVA impoundment in July 1983 desiccated about 810 hectares of Eurasian watermilfoil. A narrow, relatively weed-free band occurred after refilling and control effects extended into the following two growing seasons. In Washington, the Bureau of Reclamation lowered the water level of Banks Lake in 1994 in an effort to manage Eurasian watermilfoil populations. The success of a drawdown on Eurasian watermilfoil is dependent on several factors such as degree of desiccation (drawdowns in rainy western Washington are often ineffective), the composition of substrate (sand vs. clay), air temperature (the exposed sediments need to freeze down to 8-12 inches), and presence of snow.

Response to Mechanical Methods

Because this plant spreads readily through fragmentation, mechanical controls such as cutting, harvesting, and rotovation (underwater rototilling) should be used only when the extent of the infestation is such that all available niches have been filled. Using mechanical controls while the plant is still invading, will tend to enhance its rate of spread.

Rotovation: The British Columbia Ministry of Environment developed a barge mounted rototilling machine called a rotovator to remove Eurasian watermilfoil roots. Underwater tiller blades churn up to 8 inches into the sediment and dislodge buoyant Eurasian watermilfoil roots. Floating roots may then be collected from the water. Control with rotovation, generally extends 2 or more growing seasons.

Harvesting: Harvesting can be compared to underwater lawn mowing. Plants are cut generally 5 feet below the water's surface, collected by conveyer, and stored until disposal on land. Harvesting removes surfacing mats and creates open areas of water. However because of its rapid growth rate Eurasian watermilfoil generally needs to be harvested twice during the growing season.

Cutting: Cutting is similar to harvesting except cut plants are not picked up from the water by the cutting machine. Washington requires that cut plants be removed from the water.

Biocontrol Potentials

Insects: The United States Department of Agriculture in conjunction with the Army Corps of Engineers have carried out searches for Eurasian watermilfoil biological control agents in Pakistan, Bangladesh, China, Korea, and Yugoslavia. Several insects have been evaluated, including a number of pyralid moths and several stem-boring weevils. However, many of these insects were found to be non-specific to Eurasian watermilfoil or to offer little potential as effective biological control agents. In British Columbia, several insects were associated with Eurasian watermilfoil and a midge was investigated as a potential control agent. However, the midge proved to be extremely difficult to rear in the laboratory.

The North American weevil, *Euhyrchiopsis lecontei* (Dietz) has been found associated with declining populations of Eurasian watermilfoil in northeastern North America. *Euhrychiopsis lecontei* has been found in Washington State feeding on both Eurasian watermilfoil and northern milfoil (*Myriophyllum sibericum*) plants. Studies have shown that this native weevil appears to be a milfoil specialist and will not feed on other macrophyte species. It can be easily raised in the laboratory and laboratory-reared weevils could be used to augment natural populations, as is being tried in Vermont and in other states.

Weevil augmentation studies for Eurasian watermilfoil management are being proposed for Washington State. A researcher at the University of Washington is conducting an evaluation of whether the milfoil weevil will be a suitable control for Eurasian watermilfoil in Washington. Unfortunately, the densities of these native weevils in Washington appear to be much less than

the densities seen in other states. Perhaps the environmental conditions in Washington are not suitable for us to attain the weevil densities needed to manage milfoil?

Grass Carp: Although triploid grass carp will eat Eurasian watermilfoil, it is not a highly palatable or preferred species. To achieve control of Eurasian watermilfoil generally means the total removal of more palatable native aquatic species before the grass carp will consume Eurasian watermilfoil. In situations where Eurasian watermilfoil is the only aquatic plant species in the lake, this may be acceptable. However, generally grass carp are not recommended for Eurasian watermilfoil control.

Plant Pathogens: Interest in pathogens of Eurasian watermilfoil was stimulated by extensive mortality of Eurasian watermilfoil in Lake Venice and the Northeast River, Maryland in the late 1960s. At that time, the declines (called Northeast Disease) were suspected to be caused by a pathogen, although no pathogens were ever isolated. However Northeast Disease stimulated research into the use of plant pathogens for biological control. The plant pathogenic fungus *Mycoleptodiscus terrestris* has been shown to significantly reduce Eurasian watermilfoil biomass in laboratory studies. A commercial biotechnology firm spent several years developing this fungus as a biological tool to control Eurasian watermilfoil, but was unable to achieve control of the plant in field settings. The US Army Corps of Engineers is continuing research on plant pathogens.

PURPLE LOOSESTRIFE

Purple loosestrife (*Lythrum salicaria)* is a Eurasian native perennial wetland plant which is responsible for the degradation of a considerable amount of wetland habitat in the United States. Invasion of North American wetlands by purple loosestrife began in the early nineteenth century when the plant was introduced both as a contaminant of European ship ballast and as a valued medicinal herb for treatment of diarrhea, dysentery, and ulcers. By the 1830's, purple loosestrife was well established along the New England seaboard. The continued expansion of the plant across the country coincided with an increase in national and regional transportation systems, commercial distribution of the plant for horticultural uses, and regional propagation of plant seed for growing bee forage.

Growth Habit

Purple loosestrife prefers to grow in marshes, ponds, stream banks, ditches, and lake shores; occasionally it can be found in upland areas. It can grow to two meters (about six feet) tall and has spikes of five-petaled reddish-purple flowers. The plant's leaves occur opposite each other along a square stem. A single mature plant can produce more than 2.5 million seeds annually. The seeds are long-lived and easily dispersed by water and in mud adhering to aquatic wildlife, livestock, and people. A strong rootstock serves as a storage organ, providing resources for plant growth if the above ground stems are cut, burned, or killed by application of foliar herbicides. All of these characteristics make a very aggressive plant extremely difficult to control.

Purple loosestrife infests several thousand acres of vital riparian habitat in Washington State and is known to occur in 34 of 39 counties. The largest infestations are found in Grant County. Actual infested acreage is difficult to estimate due to the large area involved and the remote locations of many sites. A statewide inventory of purple loosestrife would be beneficial but expensive to complete.

WSDA and other weed control agencies have explored many control options including hand pulling, mechanical control (cutting and mowing), burning, water level manipulation, covering small infestations with black plastic, herbicides and biological control agents. The size and location of the infestation often dictates the most effective method of control. The areas that purple loosestrife inhabits are very sensitive to disturbance. Removing large plants usually opens up the area for a flush of seedling plants the following season that must be dealt with.

In Washington, small infestations of purple loosestrife are often controlled by hand pulling the entire plant or by removing the flower heads before viable seed have been produced. The latter method has the disadvantage of leaving the adult plant in place but does serve to eliminate the spread by seed. A permit from WSDA is required to transport and dispose of removed plants and plant parts. This is required to ensure that new infestations are not created from the removed plants. WSDA provides these permits to applicants at no cost. These sites are usually located in areas where large-scale colonization has not occurred or is not possible.

In areas where infestations are larger, hand pulling usually becomes too labor-intensive and costly to be feasible. Herbicides are used to treat areas that are too large to hand pull. Glyphosate is the herbicide most commonly used for the control of purple loosestrife. Glyphosate works well for controlling purple loosestrife plants but is a non-specific systemic and, when broadcast sprayed, can harm other vegetation in the area. 2,4-D is another approved herbicide in very limited areas. 2,4-D has the advantage of being selective for broadleaf plants, such as purple loosestrife, and does not harm monocot species that comprise many important aquatic perennial plants such as cattails. Very large infestations, where it is not financially or biologically feasible to treat with herbicides, are treated with biological control agents. In these areas there are simply too many plants to treat with other currently available control methods.

The overall purple loosestrife control program in Washington State is comprised of several parts including the following activities:

- Ongoing education of the public about the threat posed by purple loosestrife is the first step in reducing the spread in Washington State. Many federal, state and county agencies are involved in this continuing process.

- New introductions of purple loosestrife, which is sometimes sold as an ornamental, have been limited by the WSDA quarantine against the sale and transport of plants both into and within Washington State. WSDA Plant Services Specialists inspect nurseries to ensure that plants are not being sold.

- Small outlying infestations are being identified earlier and treated manually or with herbicides to eradicate and eliminate the spread of these populations.

- The large infestations, such as the Winchester Wasteway area in Grant County, are being treated with biological control agents to reduce the density and limit the spread of the infestations.

In Washington, purple loosestrife is classified by law as a noxious weed. This law requires a landowner to control the spread of the plant or prevent any seed production by the plant. Because purple loosestrife grows so aggressively, over time large stands of the plant take over an area and replace the native plant species. This results in eliminating the natural foods and cover essential to many wetland inhabitants including waterfowl. In addition, purple loosestrife can grow in and around irrigation systems and impede the flow of water. The Winchester wasteway, an irrigation system in Grant County, Washington, is reported to have one of the largest stands of purple loosestrife in the country. Purple loosestrife is a cause for grave concern among water users and purveyors.

The following list of potential sites is not considered all inclusive.

Adams County
Columbia National Wildlife Refuge
Crab Creek and drainage's
Asotin County
Snake River and its tributaries
Grand Ronde River and its tributaries
Granite Lake and its tributaries
Benton County
Yakima River and its tributaries
Columbia River and its tributaries
Chelan County
Columbia River and its tributaries
Entiat Wildlife Area
Wenatchee River and its tributaries
Yaxon Canyon Area
Mission Creek
Clallam County
Ozzette Lake
Dungeness River and its tributaries including:
    Matriotti Creek
    Cranberry Bog
    Cassalery Creek
    Meadowbrook Creek

Clark County
Columbia River and its tributaries
Columbia County
Snake River and its tributaries
Touchet River and its tributaries
Tucannon River and its tributaries
Cowlitz County
Columbia River and its tributaries and associated wetlands
Willow Grove Slough
Cowlitz River and its tributaries
Toutle River and its tributaries
Douglas County
Columbia River and its tributaries
Wells Dam Reservoir
Wells Wildlife Area
Ferry County
Columbia River and its tributaries
Sanpoil River and its tributaries
Franklin County
Columbia River and its tributaries including:
- White Bluffs Area
- Savage Island Area
- Dent Rd. to Hwy. 395 Bridge
- Sacajawea Park Area

Snake River and its tributaries including:
Skookum Area
Smith Canyon Wasteway
Grover Pond Area
Esquatzel Coulee Area
Unnamed Pond @ T.13N, R.30E, S.13
T-Lakes and Ponds Area
Youth Ranch Area
248 drain and Eagle Lakes Area
WB10WW1, WB3814WW and Surrounding Areas
Garfield County
Snake River and its tributaries
Grant County
Columbia River and its tributaries including:
sites near Crescent Bar, Sunland Estates, and between Wanapum and Priest Rapids dams.
Columbia Basin Wildlife areas including:
- Banks Lake - sites near Electric City and along the southeastern shoreline
- Gloyd Seeps and vicinity
- Quincy Lakes and vicinity
- Winchester and Frenchman Hills Wasteways

Potholes Reservoir and vicinity
Lind Coulee, Seep Lakes and Goose Lakes
Lower Crab Creek and vicinity
Upper Crab Creek and vicinity
Priest Rapids and vicinity
Esquatzel Coulee and vicinity
White Bluffs and vicinity
Royal City Lakes
Seep Lakes
Moses Lake
Rocky Ford Creek
Grand Coulee
Babcock Ridge Lake
Burke Lake
Canal Lake
Corral Lake
Evergreen Lake
Stan Coffin Lake
Warden Lake

Grays Harbor

Chehalis Wildlife Area
Chehalis River and its tributaries

Island County

Lone Lake

Jefferson County

Chimicum Creek and its tributaries
Snow Creek and its tributaries
Andrews Creek and its tributaries
Leeland Creek and its tributaries

King County

Lake Washington and tributaries
Lake Union and tributaries
Lake Sammamish
May Creek
Lake Desire
Bear Lake
Mercer Slough

Kitsap County

Long Lake and its tributaries
Burley Creek

Kittitas County

Yakima River and its tributaries
Columbia River and its tributaries
Hyak area

Denmark Pond (T17, R19, S2)
Bull Ditch

Klickitat County

Columbia River and its tributaries

Lewis County

Chehalis River and its tributaries
Newaukum River and its tributaries

Lincoln County

Columbia River and its tributaries

Mason County

Oakland Bay watershed
Totten Little Skookum watershed
West Hood Canal watershed
Skokomish watershed
Lower Hood Canal watershed
Case Inlet watershed
Chehalis watershed
Spencer Lake

Okanogan County

Okanogan River and its tributaries
Columbia River and its tributaries
Methow River and its tributaries
Washburn Island wetlands
Lake Osoyoos and its tributaries
Palmer Lake and its tributaries
Chopaka Lake and its tributaries
Wannacut Lake and its tributaries
Spectacle Lake and its tributaries
Conconully Lake and its tributaries
Twisp River and its tributaries
Pearrygin Lake and its tributaries
Lake Pateros and its tributaries
Whitestone Lake

Pacific County

Columbia River and its tributaries
Willapa River and its tributaries

Pend Oreille County

Fan Lake
Little Spokane River and its tributaries
Big Muddy Creek and its tributaries
Little Muddy Creek and its tributaries
Ione millpond
Pend Oreille River and its tributaries
Lake Sacheen and its tributaries

Cedar Creek and its tributaries
Wilderness Lake and its tributaries
Sacheen Lake

Pierce County

Cranberry Lake and its tributaries
American Lake and its tributaries
Bay Lake and its tributaries
Crescent Lake and its tributaries
Murray Creek Drainage
Spanaway Lake and its tributaries

San Juan County

None

Skagit County

North Fork of the Skagit River and estuaries
South Fork of the Skagit River and estuaries
Maddox Creek
Flowers Creek

Skamania County

Columbia River and its tributaries

Snohomish County

Snohomish River Delta

Spokane County

Little Spokane River (Long Lake) and its tributaries
Latah Creek (Hangman Creek)
Lincoln Park Pond
29th and Havana Street Pond
Spokane River and its tributaries
Long Lake (reservoir)

Stevens County

Loon Lake and its tributaries
Spokane River and its tributaries
Waitts Lake and its tributaries
William's Lake and its tributaries

Thurston County

Black River and its tributaries
Deschutes River and its tributaries
Chehalis River and its tributaries
McAllister Creek and its tributaries
Nisqually River and its tributaries
Percival Creek and its tributaries
Skookumchuck Reservoir and its tributaries
Skookumchuck River and its tributaries
Alder Lake and its tributaries
Barnes Lake and its tributaries

Bigelow Lake and its tributaries
Black Lake and its tributaries
Capital Lake and its tributaries
Chambers Lake and its tributaries
Clear Lake and its tributaries
Deep Lake and its tributaries
Elbow Lake and its tributaries
Hicks Lake and its tributaries
Lake Saint Clair and its tributaries
Lawrence Lake and its tributaries
Lois Lake and its tributaries
Long Lake and its tributaries
Longs Pond and its tributaries
McIntosh Lake and its tributaries
Munn Lake and its tributaries
Offut Lake and its tributaries
Patterson Lake and its tributaries
Setchfield Lake
Summit Lake and its tributaries
Ward Lake and its tributaries
Unnamed tributary leading into Puget Sound on Henderson Inlet (T19N., R1W., S17)
Retention pond at Capital Medical Center (T18N., R2W., S17)

Wahkiakum County

Columbia River and its tributaries

Walla Walla County

Snake River and its tributaries
Columbia River and its tributaries

Whatcom County

Nooksack River and its tributaries
Terrell Lake
Baker Lake
Ross Lake
Lake Whatcom
Samish Lake

Whitman County

Snake River and its tributaries

Yakima County

Yakima River and its tributaries
Ponds located along the I-82 corridor (I-82 Ponds)
Freeway Lakes and adjacent drainage's
Irrigation Canals and corresponding drainage's
Parker Ponds and adjacent drainage's
Satus Creek and its tributaries

APPENDIX C – EXAMPLE INTEGRATED AQUATIC VEGETATION MANAGEMENT PLAN

REQUIREMENTS FOR AN INTEGRATED AQUATIC VEGETATION MANAGEMENT PLAN FOR LAKES AND RIVERS

Please also see *A Citizen's Manual for Developing Integrated Aquatic Vegetation Management Plans* – Ecology Publication 93-93 – on the web at:
http://www.ecy.wa.gov/programs/wq/plants/management/manual/index.html

DEVELOP A PROBLEM STATEMENT

Example: In 1994 Eurasian watermilfoil was first discovered in Lake Joy. Since then the number of fishing days has declined from 100 days in 1995 to less than 25 days in 1998. In addition to losing the fishery, other recreational uses, such as swimming and water skiing have been severely impacted. Many local residents are now afraid to swim in Lake Joy and are concerned for the safety of their children…

DEFINE MANAGEMENT GOALS

Example: The management goal for Lake Joy is to return the lake to preinfestation conditions. The goal will be accomplished by controlling or eradicating Eurasian watermilfoil in an environmentally sensitive way…

DESCRIBE PAST MANAGEMENT EFFORTS (Required if the plan also covers nuisance plant control – Optional if the plan covers only noxious weed control)

- Describe previous chemical treatments and results
- Describe previous non-chemical treatments and results
- Describe the history of treatments; when started, how often, what percent of the lake was treated, names of chemicals used, and species of the plants controlled.

LIST AND DISCUSS WATERBODY AND WATERSHED CHARACTERISTICS

Watershed characteristics include:

- Location and size of the watershed.
- Land use activities (rural, single family, residential, industrial, commercial, etc.).
- Stream and wetland locations.
- Nonpoint nutrient source locations, actual or potential. Sources may include dairies, hobby farms, residential runoff, stormwater, etc.

Waterbody characteristics include:

- Location, size, depth, and shape of the waterbody.
- Water source(s) and flushing rate.
- Water quality – evaluate historical water quality data.
- Aquatic plants and algae.
- Shoreline use (residential, rural, industrial, etc.).
- Fisheries.
- Wetland areas.
- Wildlife.

LIST BENEFICIAL AND RECREATIONAL USES OF THE WATERBODY

Identify and discuss present waterbody uses such as:

- Conservancy areas including habitats that are integral to the lake ecosystem (nesting areas, rare plants or animals, fish rearing habitat, etc.).
- Water skiing areas.
- Boating and boat access areas.
- Swimming areas.
- Fishing areas.

Develop a waterbody "use" map of:

Zones showing priority uses for activities as well as other natural habitat areas for fish, waterfowl, and other wildlife.

MAP AQUATIC PLANTS

Attach a map of the waterbody that includes:

- Approximate locations and species of aquatic plants.
- Locations of wetlands.
- Locations of threatened or endangered species of plants or animals.
- Sediment type (organic, sand, silt, gravel), etc.
- Waterbody depth contour lines.

CHARACTERIZE AQUATIC PLANTS

a) Identify species, growth habit, and coverage.
b) Recognize the problems and benefits of aquatic plants.
c) Identify the life cycle and any "weak" link of the target plant species.

IDENTIFY AND DISCUSS THE AQUATIC PLANT CONTROL ALTERNATIVES, THEIR EFFECTIVENESS, ENVIRONMENTAL IMPACTS, HUMAN HEALTH RISKS, COSTS, AND THEIR APPLICABILITY TO THE WATERBODIES INCLUDED IN THE PLAN

No action – Describe the specific short- and long-term impacts associated with not controlling aquatic plants in the waterbody.

Environmental Manipulation.

- Reduce sources of nutrients to the waterbody.
- Hand pulling.
- Water level drawdown.
- Bottom barriers.

Mechanical Control Methods.

- Harvesting.
- Rotovation – underwater rototilling.
- Cutting.
- Dredging.

Biological Control Methods.

- Triploid grass carp.
- Host-specific pathogens (fungi, bacteria, virus).
- Host-specific insects.

Chemical Control Methods.

- Aquatic herbicides.
- Aquatic plant growth regulators.
- Vegetable dyes.

New Technologies: As new methodologies are developed, they need to also be considered.

IDENTIFY THE PLANT PROBLEMS IN SPECIFIC LOCATIONS BY ASSESSING THE CONTROL LEVELS IN EACH OF THE AREAS IDENTIFIED ON THE USE MAP.

This can be accomplished by overlaying the use map with the plant map and including a brief discussion. Various levels of control within each use zone need to be evaluated such as:

No control – some conservancy areas may be best managed by being left in a natural state.

Low level of control – this may include conservancy areas to protect and enhance habitat value. Examples include:

- Developing fishing lanes to create optimal warm-water fishing opportunities.
- Developing control strategies which protect shoreline-wetland vegetation.
- Considering depths and areas of control for activities such as water-skiing, boating, aesthetics, and swimming.

High intensity of control – may include areas such as beaches, docks, and boat ramps where any vegetation may be unacceptable.

CHOOSE THE BEST COMBINATION OF OPTIONS OF SITE-SPECIFIC LEVELS OF CONTROL USING THESE CRITERIA.

a) Identify proposed control methods, areas where they will be applied, timing of the control action, and targeted degree of control.
b) Assess the duration of control and its compatibility with the site.
c) Determine capital costs and operation and maintenance costs.
d) Determine the degree of control to the site, including evaluating whether the control strategy is appropriate to the site.
e) Evaluate the compatibility of the weed control strategy with fisheries, waterfowl, wildlife, and the ecology of the waterbody and determine whether permitting agencies will issue permits for these activities.
f) Evaluate whether the strategy has a balanced approach between waterbody enhancement and environmental protection.
g) Determine if the strategy causes minimum human health risks.

PUBLIC INVOLVEMENT

Identify interested parties such as:

- Lake residents.
- User groups (bass fishers, Ducks Unlimited, etc.).
- Local government.
- State and federal agencies.
- Environmental groups.
- Tribes

Conduct public meetings during the following times:

- At the formative stages.
- When alternatives have been developed, but before a recommended alternative has been selected.

- After selecting an alternative, but before implementation.
- During implementation, as necessary.
- During evaluation and surveillance phases, as necessary.

Obtain and document support or acceptance from interested parties.

DEVELOP AN ACTION STRATEGY WHICH IMPLEMENTS THE INTEGRATED AQUATIC PLANT MANAGEMENT PLAN

a) Develop costs and budget to implement the plan. Identify planning costs, capital costs, and operation and maintenance costs.
b) Review the costs, permit requirements, environmental issues, environmental impacts, and acceptability to lake residents and the general public.
c) Develop a short-term action plan that is possible to accomplish considering costs, evaluating whether permits can be obtained, degree of control, and public acceptance, etc.
d) Develop a long-term action plan that may require more funding than is currently available and may include managing complex permit issues.
e) Develop funding strategies by:

Identifying strengths and weaknesses of the situation such as:

- Number of property owners (public, businesses, groups, camps, etc.).
- Is there a lake association or a homeowners association?
- Identify supporting and opposing interest groups.
- Identify level and duration of funding.
  - Short-term funding for planning
  - Long-term funding for capital and operating costs

Assessing all funding options such as:

- Grants and loans
- Establishment of a Lake Management District or other taxing mechanism.
- Formation of a lake or homeowners association with the ability to collect revenue.

Developing an action plan with optimal short and long-term funding sources to meet the integrated aquatic plant management plan. (Recognize that grant funding is generally short-term project-orientated, whereas problem, and action plans are long-term in nature).

MONITORING AND EVALUATION OF PLAN

1. Develop a detailed plan for monitoring and reporting the relative degree of success. Success can be measured by the increase or improvement of the beneficial uses of a waterbody.
2. Describe surveillance strategy.
3. Describe long-term revenue sources for continual management.

APPENDIX D -- GLOSSARY

DEFINITIONS

"**Administrator**" means the administrator of the EPA.

“Antidegradation Policy” is as stated in WAC 173-201A-070.

"**Authorized representative**" means:

1. If the entity is a corporation, the president, secretary, treasurer, or a vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operation facilities, if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

2. If the entity is a partnership or sole proprietorship, a general partner or proprietor, respectively; and

3. If the entity is a federal, state or local governmental facility, a director or the highest official appointed or designated to oversee the operation and performance of the activities of the government facility, or his/her designee.

The individuals described in paragraphs 1 through 3, above, may designate another authorized representative if the authorization is in writing, the authorization specifies the individual or position responsible, and the written authorization is submitted to the Department.

"**Best management practices (BMPs)**" means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State and their sediments. BMPs also include, but are not limited to, treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

“**Broadcast”** means to scatter about over a wide area.

“Certified Applicator” "Certified applicator" means any individual who is licensed as a commercial pesticide applicator, commercial pesticide operator, public operator, private-commercial applicator, demonstration and research applicator, or certified private applicator, or any other individual who is certified by the director to use or supervise the use of any pesticide which is classified by the EPA or the director as a restricted use pesticide. **[**RCW 17.21.020 (5)]

"Code of Federal Regulations (CFR)" means a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government. Environmental regulations are in Title 40.

"Composite sample" means the combined mixture of not less than four (4) "discrete samples" taken at selected intervals based on an increment of either flow or time. Volatile pollutant discrete samples must be combined in the laboratory immediately prior to analysis. Each discrete sample shall be of not less than 200 ml and shall be collected and stored in accordance with procedures prescribed in the most recent edition of Standard Methods for Examination of Water and Wastewater[27].

"Conveyance" means a mechanism for transporting water or wastewater from one location to another location including, but not limited to, pipes, ditches, and channels.

"Daily maximum" means the greatest allowable value for any calendar day.

"Daily minimum" means the smallest allowable value for any calendar day.

"Dangerous waste" means the full universe of wastes regulated by Chapter 173-303 WAC, including hazardous waste.

"Degrees C" means temperature measured in degrees Celsius.

"Degrees F" means temperature measured in degrees Fahrenheit.

"Department" means the Washington State Department of Ecology.

"Detention" means the collection of water into a temporary storage device with the subsequent release of water either at a rate slower than the collection rate, or after a specified time period has passed since the time of collection.

"Director" means the director of the Washington State Department of Ecology or his/her authorized representative.

"**Discharger**" means an owner or operator of any "facility", "operation", or activity subject to regulation under Chapter 90.48 RCW.

"**Discrete sample**" means an individual sample which is collected from a wastestream on a one-time basis without consideration to flow or time, except that aliquot collection time should not exceed fifteen (15) minutes in duration.

"**Effluent limitation**" means any restriction established by the local government, the Department, and EPA on quantities, rates, and concentrations of chemical, physical, biological, and/or other effluent constituents which are discharged from point sources to any site including, but not limited to, waters of the state.

"**Environmental Protection Agency (EPA)**" means the U.S. Environmental Protection Agency or, where appropriate, the term may also be used as a designation for a duly authorized official of said agency.

"**Erosion**" means the wearing away of the land surface by movements of water, wind, ice, or other agents including, but not limited to, such geological processes as gravitational creep.

"**Existing operation**" means an operation which commenced activities resulting in a discharge, or potential discharge, to waters of the state prior to the effective date of the general permit for which a request for coverage is made.

"**Facility**" means the actual individual premises owned or operated by a "discharger" where process or industrial wastewater is discharged.

"**FWPCA**" means the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.), as now or as it may be amended.

"**General permit**" means a permit which covers multiple dischargers of a point source category within a designated geographical area, in lieu of individual permits being issued to each discharger.

"**Gpd**" means gallons per day.

"**Grab sample**" is synonymous with "discrete sample".

"**Ground water**" means any natural occurring water in a saturated zone or stratum beneath the surface or land or a surface water body.

Hazardous waste" means those wastes designated by 40 CFR Part 261, and regulated by the EPA.

"**Individual permit**" means a discharge permit for a single point source or a single facility.

"**Mg/L**" means milligrams per liter and is equivalent to parts per million (ppm).

"**Monthly average**" means that value determined by the summation of the instantaneous measurements during any single month divided by the number of instantaneous measurements collected during that same single month.

"**New operation**" means an operation which commenced activities which result in a discharge, or a potential discharge, to waters of the state on or after the effective date of an applicable general permit.

"**NPDES**" means the National Pollutant Discharge Elimination System under section 402 of FWPCA.

"**Operation**" is synonymous with "facility".

"**Party**" means an individual, firm, corporation, association, partnership, copartnership, consortium, company, joint venture, commercial entity, industry, private corporation, port district, special purpose district, irrigation district, trust, estate, unit of local government, state government agency, federal government agency, Indian tribe, or any other legal entity whatsoever, or their legal representatives, agents, or assignee.

"**Permit**" means an authorization, license, or equivalent control document issued by the Department to implement Chapter 173-200 WAC, Chapter 173-216 WAC and/or Chapter 173-226 WAC.

"**Person**" is synonymous with "party".

"**pH**" means the logarithm of the reciprocal of the mass of hydrogen ions in grams per liter of solution. Neutral water, for example, has a pH value of 7 and a hydrogen-ion concentration of 10^{-7}. pH is a measure of a substance's corrosivity (acidity or alkalinity).

"**Point source**" means any discernible, confined and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture.

"**Pollutant**" means any substance discharged, if discharged directly, would alter the chemical, physical, thermal, biological, or radiological integrity of the waters of the state, or would be likely to create a nuisance or render such waters harmful, detrimental or injurious to the public health, safety or welfare, or to any legitimate beneficial use, or to any animal life, either terrestrial or aquatic. Pollutants include, but are not limited to, the following: dredged spoil,

solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, pH, temperature, TSS, turbidity, color, BOD_5, TDS, toxicity, odor and industrial, municipal, and agricultural waste.

"**Priority pollutant**" means those substances listed in the federal 40 CFR Part 423, Appendix A, or as may be amended.

"**Reasonable times**" means at any time during normal business hours; hours during which production, treatment, or discharge occurs; or times when the Department suspects occurrence of a violation.

"**Regional administrator**" means the regional administrator of Region X of the EPA or his/her authorized representative.

"**Retention**" means the collection of water into a permanent storage device, with no subsequent release of water.

"**Severe property damage**" means substantial physical damage to property, damage to the pretreatment facilities or treatment/disposal facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays or losses in production.

"**Shall**" is mandatory.

"**Significant**" is synonymous with "substantial".

"**Site**" means the land or water area where any "facility", "operation", or "activity" is physically located or conducted, including any adjacent land used in connection with such facility, operation, or activity. "Site" also means the land or water area receiving any effluent discharged from any facility, operation, or activity.

"**Small business**" has the meaning given in RCW 43.31.025(4).

"**Standard Industrial Classification (SIC) Code**" means a classification pursuant to the Standard Industrial Classification Manual issued by the U.S. Office of Management and Budget.

"**State**" means the State of Washington.

"**Substantial**" means any difference in any parameter including, but not limited to, the following: monitoring result, process characteristic, permit term or condition; which the Department considers to be of significant importance, value, degree, amount, or extent.

"**Surface waters of the state**" means all waters defined as "waters of the United States" in 40 CFR 122.2 within the geographic boundaries of the state of Washington. This includes lakes, rivers, ponds, streams, inland waters, salt waters and all other surface waters and watercourses within the jurisdiction of the state of Washington.

"**Total suspended solids (TSS)**" means total suspended matter that either floats on the surface of, or is in suspension in water or wastewater, expressed in mg/L.

"**Toxic amounts**" means any amount, i.e., concentration or volume, of a pollutant which causes, or could potentially cause, the death of, or injury to, fish, animals, vegetation or other desirable resources of the state, or otherwise causes, or could potentially cause, a reduction in the quality of the state's waters below the standards set by the Department or, if no standards have been set, causes significant degradation of water quality, thereby damaging the same.

"**Toxics**" means those substances listed in the federal priority pollutant list and any other pollutant or combination of pollutants listed as toxic in regulations promulgated by the EPA under section 307 of the FWPCA (33 U.S.C. 1317 et seq.), or the Department under Chapter 173-200 WAC, Chapter 173-201A WAC, or Chapter 173-204 WAC.

"**Unirrigated**" means any lands having not been irrigated within 10 days prior to, or within 60 days after the application of any wastestream.

"**Upset**" means an exceptional incident in which a discharger unintentionally and temporarily is in a state of noncompliance with permit effluent limitations due to factors beyond the reasonable control of the discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation thereof.

"**Waters of the state**" means all waters defined as "surface waters of the state" and all waters defined as "waters of the state" in RCW 90.40.020.

"**Water quality**" means the chemical, physical, biological characteristics of water, usually in respect to its suitability for a particular purpose.

“Water Quality Preservation Area (WQPA)” means waters which have been designated as high quality waters based upon one or more of the following criteria:

1. Waters in designated federal and state parks, monuments, preserves, wildlife refuges, wilderness areas, marine sanctuaries, estuarine research reserves, and wild and scenic rivers;
2. Aquatic habitat having exceptional importance to one or more life stage of a candidate of listed priority species, established by the state Department of Fish & Wildlife, or a federally proposed or listed threatened or endangered species;

3. Rare aquatic habitat, ecological reference sites, or other waters having unique and exceptional ecological or recreational significance.

"**Water quality standards**" means the state of Washington's water quality standards for ground waters of the state (Chapter 173-200 WAC) and the state of Washington's water quality standards for surface waters of the state (Chapter 173-201A WAC).

In the absence of other definitions as set forth herein, the definitions as set forth in 40 CFR Part 403.3 shall be used for circumstances concerning the discharge of wastes.

APPENDIX E --

HERBICIDE APPLICATION RESIDENTIAL AND BUSINESS NOTICE

_____ will be treated with aquatic herbicide(s) on/or between _____. Attached is a map of the area(s) to receive treatment.

Notices will be posted at the shoreline. They will also be posted at all boat launches on the waterbody within 1.5 mile of the herbicide treatment area. If there are fishing restrictions, these will be posted on buoys around the treatment area(s).

The herbicide(s) and active ingredient(s) to be used are:

Please obey the following use restrictions within the marked treatment areas:

Herbicides to be used, their water restrictions, and the dates and locations of treatment(s) scheduled for the remainder of the season are:

For more information contact the Applicator at:

_____

This herbicide treatment is regulated under a permit issued by the Department of Ecology, Water Quality Program and administered by the Washington Department of Agriculture. These herbicides have been approved for this purpose by EPA and the State Department of Agriculture.

No later than the day following distribution of the Herbicide Application - Residential and Business Notice, a copy and the date of distribution of the notice shall be mailed or faxed or e-mailed to the Ecology contact below:

Kathy Hamel
Washington State Department of Ecology
Water Quality Program
P.O. Box 47600
Olympia, WA 98504-7600

Telephone: (360) 407-6562
Fax: (360) 407-6426
E-mail: kham461@ecy.wa.gov

Appendix F Response to Comments

Written comments on the draft permit were received by the following individuals or organizations

1. Clinton Campbell, Kyle Murphy, and Greg Haubrich, Washington State Department of Agriculture
2. Stacey L. Stater, Monsanto Company
3. Sharon Sorby, Pend Oreille County Noxious Weed Control Board
4. Scott McKinnie, Far West Agribusiness Association
5. Patty Lynch, Washington State Department of Transportation
6. Damon Diessner, City of Bellevue
7. Wendy Sue Wheeler, Washington State Department of Agriculture
8. David E. Ortman, Wise Use Movement
9. Mr. Charles Simenstad, fisheries biologist
10. Sue Winterowd, Stevens County Noxious Weed Control Board
11. Bill Wamsley, Lewis County Noxious Weed Control Board
12. Cathy Lucero, Clallam County Noxious Weed Control Board
13. Steve McGonigal, The Washington State Noxious Weed Control Board
14. Jane Wentworth, King County Noxious Weed Control Board
15. Jennifer L. Shaw, Syngenta
16. John Carleton, Washington Department of Fish and Wildlife
17. Heather Hansen, Washington Friends of Farms and Forests
18. Fritzi Cohen, Moby Dick Hotel
19. Judy Feldman, Island County Noxious Weed Control Board
20. Todd Davis, Kittitas County Noxious Weed Control Board
21. Dave Swindale, Lake Sylvia resident
22. Terry McNabb, AquaTechnex
23. Monica Hoover, USDA – NRCS
24. Dr. Kim Patten, WSU
25. Marc Stairet, Benton County Noxious Weed Control Board

Oral testimony was received from the following individuals at the public hearings; a transcript is available from Ecology upon request.

March 11, 2002 Hearing in Yakima Washington

26. Greg Haubrich, Washington State Department of Agriculture

March 14, 2002 Hearing in Lacey Washington

27. Steve McGonigal, Washington State Noxious Weed Control Board
28. Dick Sheldon, Northern Oyster Company
29. Marshall Mooring, Mason Lake resident

30. Heather Hansen, Friends of Farms and Forests
31. Cathy Lucero, Clallam County Noxious Weed Control Board

March 25, 2002 Hearing in Spokane, Washington

32. Sharon Sorby, Pend Oreille County Noxious Weed Control Board
33. Mr. Bunch, Concerned citizen
34. Gerald Adrian, Cerexagri
35. Mary Lou Peterson, Okanogan County Noxious Weed Control Board
36. Jim Richardson, Loon Lake resident
37. Pete (last name was not audible on transcript), Farwest AgriBusiness Association

COMMENTS

General Comments to permit

Commentors # 3, 10, 11, 12, 13, 14, 19, 20, 27, 31, 35, 36 all support having the Department of Agriculture as the permit holder.

Commentor # 8 is strongly opposed to the issuance of an NPDES general permit to allow the discharge of unlimited amounts of pollutants. He indicated that the proposed NPDES permit is inadequate and does not meet the goals or policies of the Federal Clean Water Act.

Answer: The proposed permit meets the regulations based on implementation of the Federal Clean Water Act.

Commentor # 33 had general concerns about pesticide use in general but was specifically worried about the impacts of pesticide use on bees.

Answer: All herbicides proposed for use under this permit have undergone a risk assessment by Ecology. Bees are not likely to come in contact with fluridone or endothall because these herbicides are applied directly to the water. Bees are more likely to come in contact with 2,4-D or glyphosate which are used for emergent plant control. Glyphosate is nontoxic to honeybees. Its oral and dermal LD50 is greater than 0.1 mg/ bee. The 2,4-D formulations allowed under the general permit, dimethylamine salt and butoxyethyl ester, are not toxic to bees at the concentrations used to control emergent weeds. There are 2,4-D formulations not allowed for use by this permit that are moderately toxic to honeybees. However, it is much more likely that glyphosate will be the herbicide of choice when treating emergent species.

Commentors # 32, 35, 36, and 37 asked Ecology to keep the permit simple, inexpensive, and streamlined.

Answer: Permitting requirements for marine and freshwater noxious emergent plants are very similar to that required under our former regulating program. Permits for lakes have been

streamlined by Agriculture agreeing to provide umbrella coverage to applicators under their permit.

C1 – ACTIVITIES COVERED

Commentors # 17 and # 30 question why Ecology is requiring permit coverage. The understanding was that these permits are being offered to protect users from third party lawsuits.

Answer: Ecology has had oversight over aquatic herbicide application in Washington waters for many years because of the need to modify water quality standards for a short term and will continue in this role.

Commentors # 1, 3, 5,12, 13, 14, 20, 23 26, 27, 31 request clear and concise site definitions for wetlands, seasonally dry wetlands, seasonal creeks where there is no standing water, shorelines, and mean high water line to better define for applicators when and where various herbicides will be permitted.

Answer: An additional sentence has been added to C1 - Activities Covered to clarify when the permit is needed.

Permit Change: "Weed control activities with herbicides conducted on seasonally dry land surfaces where the bio-available active ingredient does not persist at time of water return are not required to be covered under this permit."

Commentor # 12 asks "Is there a buffer zone that determines how near an application may be to a stream or lake before a permit is required, and if so, what is its width?

Answer: The applicator or permittee should determine the need for or size of a buffer zone. You do not need a permit if you do not get the herbicide into the water.

Commentor # 22 wants specific categories of waterbodies exempted from the permit and suggests that exempt waters should be those waterbodies that are owned by the sponsor, don't discharge during the period where the herbicide is detectible in the water, are not waters of the US, and applications are covered by a stormwater NPDES permit.

Answer: Activities covered under this permit are for the discharge of aquatic herbicides for the control of noxious or quarantine list weeds into waterbodies that are contiguous with rivers, creeks, and lakes, or into navigable waters, or in other situations as determined by Ecology. If the waterbody you are proposing to treat meets this definition, you need permit coverage; otherwise not.

C3. HOW CAN COVERAGE BE OBTAINED?

Commentor # 16 asks if there will be some acknowledgment by the Department that the completed application has been received.

Answer: Yes

Commentors # 21 and # 22 are concerned that there is no provision for non-government agencies to obtain coverage under this permit.

Answer: The Washington State Department of Agriculture (WSDA) will obtain coverage under the Noxious Weed Permit from Ecology. WSDA has agreed to provide "umbrella" coverage to cooperators wanting to treat noxious weeds under their permit. Non-governmental agencies, local government, other state agencies, lake associations, and private individuals can obtain coverage under WSDA's permit. WSDA is developing an application form for their cooperators to use to apply for permission to use herbicides to control noxious aquatic weeds.

Commentor # 10 would like Ecology to clarify what is an "existing Aquatic Noxious Weed Control Program".

Answer: A governmental agency with an existing Aquatic Noxious Weed Control Program is an agency that has staff that are routinely engaged in control of aquatic noxious weeds. The WSDA will fill out the Notice of Intent to apply for coverage (NOI) and they are considered to have an existing program for the control of noxious weeds. Local government entities, individuals, lake associations, etc. will obtain coverage under Agriculture's permit and Agriculture will develop a separate application for their cooperators.

Commentor # 6 worries that "with the change to using the State Environmental Policy Act (SEPA) for determining the environmental impacts from aquatic pesticide application, the cost and burden of determining whether to approve the application has been shifted to local governments that do not necessarily have the expertise or funding for this process."

Commentors # 4, 14, and 31 worry that there needs to be some sort of streamlined process or emergency response flexibility to allow treatment of pioneering infestations within 2-3 weeks rather than 60 days.

Answer: The SEPA process was completed by Ecology for each of the aquatic herbicides allowed under this permit. Additional SEPA actions on other pesticides will be led by Ecology. The WSDA will be covered under the noxious weed permit (although other government entities are not excluded for applying for primary coverage). People who want to use herbicides to treat noxious weeds in an aquatic situation will then apply to WSDA to receive coverage under their permit. This should streamline the process and the permitting burden will not be on the local government.

Commentor #5 is concerned that the current permit language does not adequately address unanticipated events, like weeds spreading in new areas that have noxious characteristics or the discovery of a new treatment technology.

Answer: Any plants on the Washington State Noxious Weed List or Agriculture's quarantine list may be treated under this permit. New herbicides will have to be evaluated by Ecology through a SEPA process before they will be allowed to be used under this permit. See Section C2. Geographic Area Covered – "The specific areas where noxious weed control activities are covered are described by each request for inclusion in WSDA coverage. Additional areas where noxious weeds are found and require control may be treated and shall be reported to Ecology". This section allows for treatment of infestations of noxious weeds discovered after the application for coverage is submitted. The public notification procedure for lakes requires notification at least ten days prior to herbicide application.

Permit Change
All the specific areas where aquatic noxious weed control activities are covered are described not in each application for coverage but in the request for inclusion under the coverage held by WSDA or another government agency.

S1 – DISCHARGE LIMITATIONS – A. WASTE DISCHARGES

Commentor #7 would like a separate paragraph for marker dyes since they do not meet the legal definition of a spray adjuvant in Washington State. She suggests that food grade dyes are appropriate marker dyes.

Permit change
Answer: The permit has been modified according to the comment.

Commentors # 4 and # 17 indicated that triclopyr and imazapyr have received EPA approval for the control of aquatic weeds and wonder how long it may take until Ecology approves these products through the SEPA process.

Answer: Triclopyr and imazapyr have not yet received approval from EPA for the control of aquatic weeds. When these products are registered for aquatic use by EPA and by the Washington State Department of Agriculture, they must go through a SEPA process (Supplemental Environmental Impact Statement including a risk assessment) before they can be allowed for use under the permit.

Commentor # 15 asks how long before diquat is through the SEPA process.

Answer: Diquat was scheduled to go through the SEPA process in 2001, but staff were diverted from this task to work on NPDES permit development. At our current staffing level, Ecology anticipates a minimum time frame of six months until diquat will be through the SEPA process.

Commentor # 17 wants to know how long it will take to complete the multi-agency SEPA process for other chemicals. Delaying the use of other products hinders weed control, increases costs and may be less environmentally sensitive.

Answer: We understand your concerns. Unfortunately Ecology had to reassign staff to permit development at the expense of updating the EIS.

Commentor # 2 would like Ecology to change glyphosate to N-(phosphonomethyl)glycine, salt to avoid inadvertently excluding a different salt.

Answer: The salt specified in the permit has been evaluated under our EIS process. The other salts have not been evaluated and will not be included in this permit at this time.

Commentor # 8 wants to know whether non-target impacts to eelgrass beds are allowed under this permit.

Permit Change

Answer: Some non-target impacts are allowed for noxious weed control efforts in this permit. To address the concern over impacts to eelgrass beds, an additional BMP has been added to S6 on Spartina treatment requirements calling for measures to avoid impacts to eelgrass. These measures are derived from the "Final EIS for Noxious Emergent Plant Control" (November 1993) mitigation measures for Spartina control in the vicinity of eelgrass beds .An exception to acceptable impacts on nontarget plants is also inserted in S1, discharge limitations.

Commentor # 8 indicated that the draft NPDES for burrowing shrimp control does not allow discharge of carbaryl to the waters of the Shoalwater Tribe. He questions why the noxious weed permit does not prohibit the discharge of glyphosate to Tribal waters.

Answer: The Shoalwater Tribe did not request that this language be added to this permit. The Tribe has never detected glyphosate on their lands due to spartina spraying.

S1 DISCHARGE LIMITATIONS – B. TEMPORARY WATER QUALITY MODIFICATIONS

Commentor # 4 was concerned that removal of vegetation would cause habitat loss.

Answer: This permit is for the removal of noxious vegetation. Noxious weeds often form dense monocultures that exclude native plant communities and may provide poor quality food and habitat. The removal of noxious vegetation should open up areas for native plant communities to re-establish.

Commentors # 15 and # 17 disagreed with the wording of the second paragraph under S1. B. The commentors pointed out that if noxious weeds are present in a location, it is not in a natural condition.

Permit Change
Answer: The permit language has been modified.

S1. DISCHARGE LIMITATIONS – C. SPECIFIC RESTRICTIONS FOR LAKES

Commentors # 4, 10, 12, 17, 22 all had concerns and want clarification about the notification requirement for irrigation and livestock watering for lake treatments.

Permit change
Answer: The permit language has been changed to reflect the stated concerns.

Commentor #2 urges Ecology to consider allowing the use of more surfactants for glyphosate in floating leaved treatment in lakes because LI-700 may not provide the best control and demonstrates only marginally more favorable toxicity ratings.

Answer: Ecology intends to evaluate surfactants under the SEPA process at some future time. When these surfactants are evaluated and approved for use, they will be allowed for use under this permit.

Commentor # 4 would like to know what requirements/restrictions will the state require for triclopyr, imazapyr, and diquat.

Permit Change
Answer: These requirements/restrictions will be developed during the SEPA process that each herbicide undergoes. The public will have an opportunity to comment at that time. A monitoring condition for lakes only was added to the permit in anticipation of these potential SEPA actions.

Commentor # 6 would like salmonid restriction periods identified by WRIA and published annually before the permit application period.

Answer: The salmonid restriction periods are determined by the Department of Fish and Wildlife. We agree that a timing chart would be useful.

Commentor # 6 questions whether Ecology should allow endothall use at all when salmonids are present since seawater challenge experiments with endothall products have shown that chinook smolts have poor survivability?

Answer: Ecology has built in some fish protections into this permit**.** Permit was changed slightly to allow WSF&W more time to respond to proposed treatments in lakes with endothall and 2,4-D.

Commentor # 4 would like a regularly updated directory of "local fish biologist contacts" for each waterbody and questions what the consequences may be if the local biologist doesn't respond to the contact.

Answer: The Washington Department of Fish and Wildlife maintains a list of biologists for each region. If the biologist is contacted and provided information about the proposed treatment and does not respond, then the treatment can take place as scheduled.

Commentor # 22 is concerned about the requirement for a Department of Fish and Wildlife biologist to sign off on each application for Aquathol K, Aquathol, and 2,4-D use in salmonid-bearing waters. The commentor considers this permit to be a non-permit that conflicts with state law.

Commentor # 16 is pleased that Ecology includes consultation with WDFW biologists in cases potentially affecting impacts on salmonids.

Permit Change

Answer: Because many salmonids are threatened or endangered, an extra level of protection is needed to ensure that impacts to them are minimized. The Department of Fish and Wildlife is developing site-specific timing tables that may be used in lieu of consultation when the timing tables become available.

Commenter # 17 suggests that if fish biologists stop the use of endothall and 2,4-D, they must provide clear rationale and respond in adequate time for the applicator and lake district to make other plans.

Answer: Concerns by Fish and Wildlife about the use of endothall and 2,4-D should be addressed during the development of Integrated Vegetation Management Plans (S5.). In early infestation situations, it would be prudent to immediately contact the fish biologist to discuss proposed herbicide applications.

Commentor # 6 asked why there were no salmonid restriction periods for glyphosate which could be applied for purple loosestrife control in salmonid bearing waters.

Commentor # 9 suggests that the best response to protect endangered anadromous fish in northern Puget Sound is through a non-chemical, integrated program of spartina control. If chemical spraying is not curtailed, any permit issued should limit chemical application to periods with least juvenile salmon utilization of estuarine habitats, such as during or after the month of October, and after multiple spartina mowings during the summer.

Answer: Glyphosate is applied to the plants rather than directly into the water. We anticipate that under careful application, only minimal amounts of this herbicide should enter the water. Ecology's 1993 Noxious Emergent Plant Management Environmental Impact Statement reports on a seawater challenge test conducted with Roundup® (a terrestrial herbicide containing glyphosate). "Mitchell et al. examined the efforts of Roundup® exposure on the osmoregulation of coho salmon smolts. They found that yearling smolt survival after 24 hours in seawater was unaffected by exposure to Roundup® concentrations of up to 10 times those encountered in water immediately after aerial application (2.78 mg/L). Furthermore, they report no abnormal responses in smolts when a 10-day freshwater recovery period was permitted between herbicide and seawater exposures. The investigators suggest that coho smolt osmoregulation and survival would not be affected by Roundup® applied at rates specified on the product label. Based on this information, it appears likely that application of Rodeo® without a surfactant will not adversely affect smoltification, smolt survival, or completion of the freshwater to saltwater transition phase of salmonid or other anadromous fish life cycles. However, the use of Rodeo® without a surfactant would likely be considered a violation of label requirements." The surfactant allowed for use in lake treatments where more herbicide would likely enter the water is LI-700. According to the 1993 EIS, LI-700 is practically nontoxic to both fish and aquatic invertebrates. While R-11 and X-77 (used for emergent weed control) are both more toxic than LI-700, the EIS concludes that "given the typical application rates of these surfactants (i.e., 0.12 - 0.5 gallons per 100 gallons of spray solution), it is unlikely that concentrations in the receiving water environment would exceed the acute toxicity thresholds."

Commentors #1 and # 2 are concerned that by listing Rodeo® in parentheses after glyphosate, Ecology may be giving the impression that this product is the only one allowed. There are other glyphosate products registered with the same formulation that should be allowed for use under this permit.

Permit Change

Answer: We have changed the permit to clarify this point. Herbicides with different trade names but with the same formulation as the products listed in the permit may be used interchangeably.

Commentor # 8 is concerned about the long-term harm to the environment and has interpreted this permit to mean that glyphosate may be sprayed on a continuous basis for five months a year for five years.

Answer: Glyphosate will be applied under an IPM plan. Under S6 Best Management Practices conditions for spraying are outlined. Spraying cannot occur on a continuous basis since wind speed, drying time, and retreatment conditions must be met before retreatment can occur.

S2. MONITORING REQUIREMENTS

Commentors # 3, 14, 17, 21, 27, 28, 29, and 32 are concerned that the monitoring and data storage requirements are excessive and unnecessarily increase the cost of noxious weed control.

Answer: Data storage is already required under FIFRA. We anticipate that the Department of Agriculture will take the lead in developing and overseeing monitoring programs for marine and freshwater emergent noxious weeds. Monitoring for lake noxious weed programs will occur mainly via the Aquatic Weeds Grant program. Self-monitoring continues to be an essential part of the NPDES program. The permit provides options to satisfy the monitoring requirements, allowing a range of potential monitoring costs.

Commentor # 12 requests that if the first year of monitoring does not reveal significant results for some of the monitoring intervals and distances, that Ecology place a provision in the permit that allows those monitoring intervals and distances to be dropped or reduced.

Answer: It is our intent to collect five years of data and to evaluate the data before the general permit is reissued.

Commentor # 2 believes that a monitoring program is not a necessary part of the general permit since extensive study and evaluation of environmental impacts are included in the FIFRA registration process.

Answer: The environmental impacts of the discharge of each of the permitted herbicides has not been demonstrated to the extent necessary to satisfy the requirements based on the CWA and the water quality laws and regulations of the state. Monitoring is required to determine if the discharges are in compliance with permit requirements and to provide additional data for the development of the next permit.

Commentors # 4 and # 17 question whether it is necessary to require herbicide volatility, degradation studies, pesticide persistence. This data is available from EPA.

Permit Change

Answer: The permit has been modified so that herbicide volatility and degradation studies will no longer be required. EPA approved persistence studies may be included in the monitoring report if it is explained in the monitoring plan.

Commenter # 14 points out that if monitoring requirements begin in 2003 why must reports for 2002 be submitted.

Answer: All monitoring data must be submitted to the department according to federal regulation. If no monitoring has been performed in 2002, submittal of a notification that no monitoring has been performed by the permittee should be relatively simple.

Commentors # 15 and # 34 would like to see other manufacture's analytical methods (similar to the assay done by SePRO and allowed under this permit) added to the list of approved methods.

Permit Change

Answer: The permit has been modified so that Enzyme Linked Immunosorbent Assay (ELISA) tests will be allowed in addition to the standard analytical methods.

Commentor # 4 points out that the CFR's are for priority pollutants and related chemicals. There is no mention or consideration of approved FIFRA methods in the permit.

Answer: The CFR part 136 applies to many pollutants other than priority pollutants. Ecology has modified the permit to allow ELISA testing.

Commentor # 8 finds that waiting until 2003 to impose monitoring is not acceptable.

Answer: Due to the timing of permit issuance, Ecology waived the monitoring requirements for 2002. The permit does not become effective until mid-June, leaving insufficient time to develop an annual monitoring plan. Most noxious weed control occurs during the summer months.

S3. REPORTING AND RECORD KEEPING REQUIREMENTS

Commentor # 8 finds it unacceptable for monitoring requirements to be submitted annually and requests that any monitoring reports be submitted monthly.

Answer: It takes time for laboratory analysis and compilation of field data to occur. Ecology prefers to receive an annual monitoring report compiled by the permittee into one cohesive package rather than in piecemeal fashion.

Commentors # 4 and # 17 point out that developing and implementing a records retention and retrieval system significantly increases costs and personnel time.

Answer: The record keeping requirements in the Noxious Weed Permit are no more rigorous than the requirements that were expected of applicants under Ecology's herbicide permitting program prior to 2002. The system of records retention are not dictated in the permit so the costs are totally controllable by the permittee. Retention of monitoring records are required by federal law.

Commentor # 15 would like to know who will develop containment and cleanup methods.

Answer: It is the responsibility of the discharger to develop containment and clean up methods. The Material Safety Data Sheet for each product should contain spill or leak cleanup procedures for each herbicide.

S4. Integrated Pest Management Plan

Commentor # 14 wants to know what constitutes a long term or whole lake pesticide application.

Answer: Whole lake pesticide applications occur when at least 50 percent of the lake littoral zone is treated. Long-term pesticide application occurs when pesticide application routinely occurs for 2-3 years and is anticipated to continue on this basis.

Commentor # 14 wants to know whether treating sections along the shoreline of a lake is considered under the emergents only or the lakes only section.

Permit Change
Answer: If you are treating freshwater emergents along the shoreline of a lake then you would be covered under the Noxious Freshwater Emergent Weed Control Section. This permit section was retitled to clarify this situation.

Commentor # 14 asks will regional IAVMPs be accepted for approval.

Answer: We anticipate that lake groups will be able to adopt regional plans in principle, but they will still need to perform some site-specific activities to be accepted for approval by Ecology.

Commentor # 17 and # 30 wants to know what criteria will be used by Ecology to modify or accept an integrated vegetation management plan.

Answer: Ecology has minimum standards for integrated vegetation management plans and these criteria (see Appendix C of the fact sheet) will be used by Ecology to modify site-specific lake plans. We anticipate that any modifications to IPM plans for noxious marine or freshwater emergent plants will occur in a collaborative, cooperative process between Ecology and the permit holder.

Commentor # 17 and # 30 would like to know who will approve the integrated pest management plans in Ecology and who in Ecology has the experience and background to provide guidance.

Answer: Ecology staff will review the integrated pest management plans. Staff have been reviewing lake plans for many years.

S5. COMPLIANCE SCHEDULE

Commentor # 6 is concerned that the lakes NPDES process lacks information to identify whether alternative vegetation control methods to pesticide application have been attempted unless an Integrated Vegetation Management Plan is required.

Answer: Integrated Vegetation Management Plans will be required for whole lake herbicide treatments or for repeated treatments (see Section S5 – Compliance Schedule). The planning process for lakes will be coordinated through Agriculture and Ecology.

Commentor # 10 wants to know when does the three year time period for submitting an IAVMP start.

Answer: The timing starts when the waterbody is first treated under coverage provided by the NPDES general permit.

S6. BEST MANAGEMENT PRACTICES

Commentors #1 and # 16 recommend that Ecology require the use of marker dyes for all applications, regardless of size.

Answer: Marker dyes are allowed for emergent plants use under this permit.

Commentors # 4, 15, 17, 30, and 31 object to the language in S6.8. because it implies that fish kill or adverse habitat effect is the result of herbicide application and considerable resources would be required to prove that the herbicide caused the incident.

Permit change
Answer: The wording in S6.8, now S6.7, has been slightly modified.

Commentor # 8 would like the permit to require pesticide applicators to use a Dwyer Wind Meter to measure and record wind speed continuously throughout a pesticide application.

Permit change
Answer: The language in the permit has been changed to require that wind speed be monitored and recorded periodically during herbicide applications to spartina.

Commentor # 8 has requested that the following BMP be added to the permit. "The applicator shall comply with all pesticide label instructions. When application conditions in this permit issued by the Department differ from those on pesticide labels, the more stringent of the two requirements must be complied with. However, no condition in this permit or any amended Order shall reduce the requirements or instructions on the pesticide label. All applicable federal, state, and local laws and ordinances shall be followed."

Permit change
Answer: This condition has been edited and added to the Best Management Practices

Commentor # 8 would like Ecology to list a discharge limit for glyphosate. (8)

Answer: The FIFRA label and any additional conditions specified in the permit acts as a discharge limit for glyphosate.

Commenter # 6 wants the permit to require documentation of the presence of or impairment of vertebrates and invertebrates within the application area.

Permit Change
Answer: An additional inspection requirement for lake treatments has been added to the permit to address this concern.

P1. RESIDENTIAL AND BUSINESS NOTICE PROCEDURES

Commentors # 4, 15 and 17 are concerned that excessive notification procedures create unnecessary public alarm and that these notices should be eliminated.

Permit Change
Answer: These notification procedures have been used by Ecology under the former permitting program for years. However we have reduced the notification requirements for freshwater emergent and lake treatments.

Commentor # 5 wants Ecology to clarify the 24-hour notification to Ecology requirement.

Answer: There is no 24 hour notification to Ecology required in this permit.

Commentor # 5 would like to limit notifications to those with potable water for WSDOT selective application within right-of-way or mitigation sites.

Permit Change
Answer: Ecology has removed this notification requirement for freshwater emergent plants.

Commentor # 3 indicates that the names and addresses of lake residents are not always readily available. Signage is excessive and expensive and one posting every 2,500 feet is adequate to give notice.

Answer: The signage requirements are the same as has been used for many years under Ecology's old permitting program for aquatic herbicides. We do not believe that posting every 2,500 feet is adequate.

Commentor # 21 thinks that Section P3 provides adequate notice for persons using lakes and that Section P1 is not needed.

Answer: The dual methods of notifying individuals provide an additional level of protection especially for individuals who are extremely sensitive to pesticides.

Commentor # 12 is concerned that the notification process as outlined in the draft permit does not have enough flexibility to allow immediate treatment following the discovery of new infestations of noxious weeds. There needs to be a rapid response clause otherwise, landowners may end up in violation of noxious weed control laws.

Answer: The notification requirements have been taken from the short term modifications for aquatic herbicide application that have been issued by Ecology for lake treatments for many years. These are not "new" requirements. The notification procedures allow treatment either immediately, seven days, or ten days after discovery of new infestation depending on the weed type, location, previous notification or a notification effort immediately after discovery.

As a researcher, does commentor #21 need to send a letter to every resident along the entire bay before spraying?

Answer: You will obtain coverage under the Department of Agriculture permit. You will need to tell them where you plan to spray and what chemical you will be using. For spartina projects only, the permittee (Agriculture) will notify each resident of the proposed actions under their permit. For lakes and rivers and freshwater emergent weed control, it is the responsibility of the permittee to see that the applicator provides public notification.

Commentor # 20 and # 25 are concerned that the system for notifying adjacent landowners for emergent weed control is too complicated and will discourage weed control.

Permit Change

Answer: We have modified the residential and business notification requirements to allow more methods of notification.

Commentor # 17 points out that maintaining a record retention system for seven years is excessive and very costly.

Answer: The retention of records for seven years is already a requirement under FIFRA.

Commentor # 17 points out that limiting the notification window to only ten days has the potential to seriously hamper their ability to apply herbicides at the most appropriate time.

Answer: The notification window is from 10 to 21 days prior to treatment.

Commentor # 8 requested that the permittee be required to send a letter/flier to anyone who has asked Ecology in writing to be notified of the discharge of pollutants under this permit.

Answer: WSDA indicates that they are willing to accommodate reasonable information requests.

P2. LEGAL NOTICE PROCEDURES

Commentor # 10 suggests that if there is no legal notice requirement for freshwater emergent control then this should be stated in the permit.

Answer: There are no legal notice requirements for freshwater emergent weed control.

Commentor # 21 states that publishing a legal notice has not been required for temporary water quality modifications in the past and suggests that having this requirement is of little benefit for small lakes (i.e. under 50 acres with limited public access).

Permit Change
Answer: Legal notice requirements have been removed for lakes.

P3. POSTING PROCEDURES

Commentors # 4, 15, 17 believe that the signage requirements are excessive and cause public alarm.

Answer: The signage requirements in the Noxious Weed Permit are the same requirements used for the Short Term Orders that have been issued for weed control activities prior to the NPDES program.

Commentor # 4 points out that the signage coloration requirement potentially discriminates against the color blind segment of the population.

Answer: This is not a “new” posting requirement

Commentors # 4 and # 15 question why the signage requirements for copper are less stringent than for the other herbicides.

Answer: Copper has not been used for noxious weed control in Washington. Therefore it is not included in this permit.

Commentor # 4 asks how far out do you put the buoys delineating the treatment area and how do you determine the “corners” of the treatment area without monitoring.

Answer: The permit does an adequate job of describing the positioning of the buoys. The applicator should be aware of where in the water that he or she has applied the herbicide. Buoys will be placed as directed by the permit so that they form a minimum fifty foot buffer around the area where the herbicide was directly applied.

Commentor # 21 points out that that requirements for posting on the water appear to be excessive especially on small lakes with limited public access and suggest that an exception be made for smaller lakes where adequate notice can be posted on the shoreline and at public access points.

Answer: Posting on the water at the time of treatment is necessary so that potential lake users are aware that herbicides are present in the lake water because of current or recent treatment of the lake at that site.

G3. RIGHT OF ENTRY

Commentor # 4 was concerned that the applicator would have to pay for copies that Ecology needed.

Answer: This section allows department staff to have access and to copy (at the department's expense) any records on the applicator's premises.

G5 – REVOCATION OF COVERAGE

Commentor #4 is concerned that if a sign is removed (by vandals) then the applicator may violate the permit.

Answer: Some discretion will be used by Ecology staff when determining whether or not the permittee is responsible when permit conditions have been violated.

G12. ADDITIONAL MONITORING REQUIREMENTS

Commentor # 17 suggests that the monitoring requirements in the permit are already extreme and no further monitoring should be required.

Answer: There may be special circumstances that require additional monitoring at a specific site. For instance, using an aquatic herbicide around a rare plant may trigger more rigorous monitoring than is outlined in the permit. This provision gives Ecology the discretion to require additional monitoring through an administrative order if it is warranted.

G14 – USE OF ACCREDITED LABORATORIES

Commentors # 4, 10, and 17 question how many accredited labs for pesticide residues are there in Washington and suggest that costs associated with using such laboratories may be excessive.

Answer: Ecology has a laboratory accreditation program and using an accredited laboratory is a legal requirement.

Commentor #14 asks whether the labs performing water sampling tests be required to be certified by WA state? If so, SePRO would no longer be available.

Answer: Yes. SePRO has indicated a willingness to become accredited by Ecology.

G18. DUTY TO REAPPLY

Commentor # 21 suggests that permits should be good for a minimum of 360 days rather than 180 days.

Answer: You have misunderstood this section. The NPDES permit is issued for five years. Agriculture will have to apply to Ecology for coverage 180 days prior to the expiration date of this five year permit.

Fact Sheet

Commentor # 17 says that many of the issues pointed out by advisory group members were not taken into consideration or corrected. The Fact Sheet should be revised after public comment has been received.

Answer: All relevant issues pointed out by the advisory group were considered. The response to comments serves as a revision to the fact sheet.

Page 4 - BACKGROUND INFORMATION

Commentor # 17 says that to adequately characterize existing pesticide regulations, the FIFRA registration system should be described, including the additional environmental testing and data that is required for an aquatic registration

Page 6

Commentor # 2 requests a language change “Glyphosate is not applied directly to water for weed control, but when it does enter the water, it dissipates by two primary mechanisms: partitioning from water into sediment, and microbial degradation over time in both water and

sediment. In flowing water, factors such as tributary dilution and dispersion also contribute to the dissipation of glyphosate. ------ Based on field dissipation studies, the half-life for glyphosate and AMPA in surface water ranges from a few days to 2 weeks".

Answer: The monitoring required by the general permit should lead to a better understanding of the causes of the range of time for the half-life.

Page 7

Commentor # 8 says that the Fact Sheet fails to disclose significant problems with glyphosate as set out in the 1993 Noxious Emergent Management FEIS and gives examples from the FEIS....

Answer: The referenced statements from the FEIS are merely pointing out data gaps or inconclusive studies that existed in 1993. The studies that have been done since 1993 provide information that narrows the gaps.

Page 8, final paragraph

Commentor # 16 states that there are inaccuracies in the mix of products and completion dates.

Answer: The Fact Sheet is correct except that the February 2001 date for the assessment of diquat, triclopyr, and copper compounds is inaccurate.

Page 10. Description of Aquatic Herbicide Application Techniques.

Commentor # 8 indicates that the Fact Sheet fails to describe aerial spraying. In fact the wide variety of application methods means that a general permit is inappropriate. Under 40 C.F.R. Sec. 128.22 (a)(2) (ii), general permits may only be issued if the sources within each category or subcategory all ....." Within the categories as set out by Ecology such as "Noxious emergent plant control in wetlands and shorelines" there are very different application methods .... Therefore, this category would not meet the conditions of a general permit. In addition ....a discharger may be required to apply for and obtain an individual permit when .... Regarding toxic pesticide discharges for noxious emergent plant control, there is no question that the discharges are a significant contributor of pollutants.... We are again requesting that no NPDES general permit be issued and that discharge of pollutants be evaluated as part of an individual NPDES permit application.

Answer: The correct citation is 122.28(a)(2)(ii) and the noxious weed control discharges are similar and appropriately controlled under a general permit which addresses any differences with permit conditions that are applicable to the specific herbicide application.

Page 13

Commentor # 17 notes inaccuracies on this page - the Washington Pesticide Control Act is RCW 15.58. There is no reference to IPM in the Washington Pesticide Control Act. Further, RCW 17.15 clearly states that it applies to state agencies only. Therefore, IPM plans should not be required of private applicators applying to private lakes. RCW 17.15 does not include any authorization to require APPROVAL of an IPM plan by any government agency. The fact sheet states, "IPMs require the investigation of all control options, but do not require nonchemical pest controls as the preferred option." (Note that the word "plan" has been left out of this sentence and others. The sentence is not grammatically correct without it.) Integrated pest management does not make any "requirement." It describes a decision making process. IPM is a wonderful tool that should be encouraged, but it is inappropriate and unwarranted for Ecology to require or approve such plans.

Answer: We stand corrected on the RCW. Integrated pest management is the preferred alternative identified in our 2001 Final Supplemental Environmental Impact Statement. The IPM requirements in state law pertain to state agencies and institutions and not the general public. IPM planning for the general permit is required on the basis of implementation of all known available and reasonable methods of prevention and control of pollutants.

Page 15. Water Quality Based Requirements.

Commentor # 8 points out that Rodeo® (glyphosate) is a toxic chemical, a pollutant and can impact human health……

Answer: This general permit has been developed partly because herbicides are toxic to vegetation and can be a pollutant if present in the water after the target weeds are treated.

Page 18. Table 1.

Commentor # 8 asks why does Rodeo® have no active ingredient use rate limitation.

Answer: Since glyphosate is not applied directly into water it is not appropriate to list an active ingredient concentration in treated waters.

Page 19, Table 1

Commentor # 16 asks whether Pro-Spreader Activator is one of the adjuvants listed in the draft permit, page 7, section S1, A? Perhaps the table's contents should be fully coordinated with the text in the draft permit.

Answer: Surfactants approved for use are LI-700®, R-11, X77 or other registered surfactants within the two chemical families.

Page 26

Commentor # 16 reports that hand-held wiping may have been found effective at control, but believes the technique to be impractical for implementation.

Answer: Hand-held wiping may be effective when a small number of isolated plants are present. We agree that it is not practical for large or dense plant beds.

Page 27

Commentor # 16 suggests that Ecology use the genus name, *Spartina*.

Answer: Not all spartina species are listed as noxious weeds in Washington.

Appendix B

Commentor # 8 says that on page 27, it states that a leafhopper has been suggested as a potential biocontrol agent for spartina. This leafhopper has already been released in Willapa Bay, but this fact sheet fails to state this fact or to provide any update on what effects, if any, have resulted. This lack of disclosure undermines Ecology's credibility as a protector of the environment.

Answer: Use of the leafhopper, *Prokelisia marginata*, for control of spartina is promising, and is still under investigation. It is not, at this time, feasible to rely on it as the only means to attempt control of spartina.

FORMATTING COMMENTS IN PERMIT

Commentor # 5 would like the agency director and or designee(s) included for signature authority.

Answer: The general condition already allows for delegation of signature authority.

Commentors # 1 and # 16 would like Ecology to identify XXX in P1.C1. and identify XXXXXX in P3.A.

Answer: The placeholder in P1C1 is for appendix E of the fact sheet. The placeholder in P3A was for another means of identifying public access areas. The Washington Public Shore Guide-Marine Waters is sufficient for this purpose.

Pg 17 of 29: B.

Commentor # 10 suggests that the following sentence be reworded "…shall publish …for all pesticide applications expected during the time the permit is in effect." If I understand right,

the permit is in effect for 5 years. Is that really what is meant in this line or should it read "…for all pesticide applications expected during the current treatment season."

Permit change

Answer: The wording has been changed so that the permittee is to publish legal notice for the pending treatment season.

Pg 20 of 29: 2. d)

Commentor # 10 wonders why the applicator's map shall include a 400-foot buffer strip around the treatment areas when the buoy placement only requires a 50-foot butter strip around the treatment areas. Why would a map have to show a 400-foot buffer?

Answer: The pretreatment maps are less precise than the buoys that mark the area that was finally treated.

Fact Sheet

Background information

Commentor # 7 points out that the citation for FIFRA is 40 CFR 152.

Answer: That is correct.

Page 4

Commentor # 1 notes that WAC 16-752 500 through 525 refers only to the aquatic weed quarantine list. However, there are other plants quarantined in other sections of this WAC that have the potential to establish in aquatic situations. Subsections 500 through 525 should be deleted, leaving WAC 16.752.

Answer: That is correct.

Pg 8 Bottom of page

Commentor # 10 suggests a wording change: "A second set of assessments, scheduled for completion February 2001, will evaluate diquat, triclopyr and copper compounds."

Answer: Those assessments were scheduled for February, 2001, but this date was missed due to the unexpected development of aquatic pesticide permits.

Page 20 – IPM

Commentor # 1 says that this section describes herbicides as a last resort rather than actual IPM. The definition of IPM found in RCW 17.15 is mandated for state agencies. The permit text should be made consistent with this statute.

Commentor # 8 does not agree with Ecology's definition of integrated pest management and says that under a real IPM program nonchemical pest controls are the preferred option with the use of chemicals the last resort.

Answer: Ecology is using the definition of IPM in RCW 17.15. This "means a coordinated decision making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet agency programmatic pest management objectives."

Page 23

Commentor #1 correctly points out that the correct P.O. Box for Ecology is P.O. Box 47600.

Page 25 – Spartina –

Commentor # 1 says that this section refers to impacts associated with *S. anglica*. This should refer to impacts associated with spartina rather than just one species. The entire section of the spartina section of the fact sheet is extremely outdated. Most of the information is taken from the 1994 EIS, and although this information is still relevant, much new information has arisen since 1994. Ecology should consider using more updated information for this section. The third paragraph of this section is somewhat confusing as to the locations of known infestations.

Answer: More current information on spartina infestations and control can be found in the report to the legislature of December 15, 2001 "Spartina Eradication and Control Program" (Washington State Department of Agriculture).

Classification of Adjuvants

Commentor # 7 notes – The statement "Buffering agents, marker dyes, and antifoam agents are perhaps the only two with aquatic plant management significance." This lists three not two. Marker dyes are misplaced here and belong in the next classification section titled "Marker Dyes."

Technology Based Water Quality Protection Requirements:

Commentor # 7 points out that the citation for the Washington Pesticide Control Act is incorrect. The Washington Pesticide Control Act is Chapter 15.58 RCW. 17.15 is titled

"Integrated Pest Management.… The Washington Pesticide control Act does not endorse or mention IPM. Furthermore, the IPM legislation does not refer to the Washington Pesticide Control Act. (7) In the same paragraph, change IPMs to IPM.

Commentor # 17 wants to know under what authority are IPM plans required for aquatic herbicide use.

Commentor # 17 says that the fact sheet states: "The permittee should continue to examine the possibility of alternatives to reduce the need for aquatic pesticides." It goes on to list other restrictions for herbicide use. This section is inconsistent with IPM. The goal of the permit should not be to reduce pesticide use but to ensure that water quality is protected. The goal of IPM is not to reduce pesticide use, but to manage pests in an environmentally and economically sound manner using the best combination of tools. This section is misleading in implying that IPM is a strategy for use reduction.

Commentor # 16 interprets IPM to mean that plans should be designed to minimize cumulative impacts on non-target organisms. Sometimes that would involve use of chemicals least toxic to non-target biota. Sometimes that would involve the use of more toxic (but more effective in removing target species) chemicals, but perhaps with a single application timed appropriately. The purpose would be to avoid multiple applications of the less toxic, but less effective chemicals. The issue of timing should be emphasized in this context. Timing can also be important regarding the vulnerability of non-target organisms.

Answer: The Final Supplemental Environmental Impact Statement for Freshwater Aquatic Plant Management, 2001 recommends that IPM plans be developed as the preferred alternative. The IPM plan requirement is required on the basis of implementation of all known available and reasonable methods of prevention and control of pollutants.

Table 1 – "permitted Herbicides Used for Noxious Weed Control:"

Commentor # 7 pointed out that Pro-Spreader Activator is not registered with the WSDA. Registration is required for the distribution of products in the state of Washington.

Answer: Pro-Spreader Activator should not have been listed in the table.

Geographical Area of Coverage

Commentor # 7 would like the following statement modified "Some noxious weed control situations are low priority because of minimal environmental impact when herbicides are applied according to the FIFRA label.…" This statement should include "and other state and federal laws and rules."

Answer: The statement should be " Some noxious weed control situations are low priority because of minimal environmental impact when herbicides are applied according to the FIFRA label and other state and federal laws and rules.'

Glossary:

Commentor # 10 would like "treatment area" defined.

Answer: "Treatment Area" means the actual area, terrestrial or in water, where herbicide was directly applied and intended to contain concentration of the herbicide adequate to cause the desired effect on weeds present.

Other Requests for Information

Commentor # 6 wants to know what the inspection process and frequency is for these permits?

Answer: These permits will be issued for five years. Inspections will likely be complaint-driven and as resources allow. Agriculture plans to conduct some inspections each year for the cooperators operating under their permit.

Commentor #4 would like to know how Ecology will regulate and enforce violations.

Answer: Ecology will regulate this NPDES permit just as we regulate and enforce other NPDES general permit dischargers.